

ACADEMICS & INDIVIDUAL MOTIVATION: THE KNOWLEDGE TRANSFER PARTNERSHIPS CONTEXT

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Contents

| | Page |
|--|-------------|
| 1 - Introduction | |
| 1.1 INTRODUCTION | 1 |
| 1.2 JUSTIFICATION FOR RESEARCH | 4 |
| 1.3 AIMS & OBJECTIVES | 5 |
| 1.4 RESEARCH METHODOLOGY | 6 |
| 1.5 STRUCTURE OF THESIS | 8 |
| 1.5.1 Introduction | 8 |
| 1.5.2 Chapter 1 – Literature Review – Knowledge Transfer Partnerships | 8 |
| 1.5.3 Chapter 2 – Literature Review – Motivation | 9 |
| 1.5.4 Chapter 3 – Methodology | 9 |
| 1.5.5 Chapter 4 – Data Analysis | 9 |
| 1.5.6 Chapter 5 - Discussion | 10 |
| 1.5.7 Conclusion | 11 |
| 1.6 CONCLUSION | 11 |
| 2 – Literature Review – Knowledge Transfer Partnerships | |
| 2.1 INTRODUCTION | 13 |
| 2.2 INTRODUCTION TO KNOWLEDGE TRANSFER PARTNERSHIPS | 13 |
| 2.3 DEFINITIONS OF KNOWLEDGE AND INNOVATION | 14 |
| 2.3.1 Innovation | 14 |
| 2.3.2 Knowledge | 16 |
| 2.4 KNOWLEDGE MANAGEMENT | 18 |
| 2.4.1 Knowledge hierarchy | 18 |
| 2.4.2 Theory of knowledge overview | 19 |
| 2.4.3 Transfer, sharing, exchange of knowledge | 21 |
| 2.4.4 Open innovation and co-production of knowledge | 24 |
| 2.4.5 Summary | 25 |
| 2.5 HIGHER EDUCATION POLICY | 25 |

| | | |
|---|---|----|
| 2.5.1 | European policy | 26 |
| 2.5.1.1 | Competitive advantage | 26 |
| 2.5.1.2 | Strategies to encourage innovation | 27 |
| 2.5.1.3 | Collaborations | 28 |
| 2.5.2 | UK policy | 29 |
| 2.5.2.1 | Issues of supply and demand | 30 |
| 2.5.2.2 | Collaboration | 30 |
| 2.5.3 | Funding | 32 |
| 2.5.3.1 | Higher Education funding | 32 |
| 2.5.3.2 | Research Excellence Framework | 33 |
| 2.5.3.3 | Funding knowledge exchange | 34 |
| 2.6 | KNOWLEDGE TRANSFER PARTNERSHIPS | 35 |
| 2.6.1 | Background | 35 |
| 2.6.2 | Aim | 36 |
| 2.6.3 | Process | 37 |
| 2.6.4 | Criteria | 37 |
| 2.6.5 | Benefits and outputs | 38 |
| 2.6.6 | Benefits for the knowledge base and academic | 39 |
| 2.6.7 | Benefits for the business | 39 |
| 2.6.8 | Benefits for the Associate | 39 |
| 2.6.9 | The relationship between Knowledge Transfer Partnerships & motivation | 40 |
| 2.6.10 | Summary | 41 |
| 2.7 | BEST PRACTICE FOR THE TRANSFER OF KNOWLEDGE | 41 |
| 2.7.1 | Effective knowledge transfer | 41 |
| 2.7.2 | Effective knowledge transfer and Knowledge Transfer Partnerships | 44 |
| 2.7.3 | Summary | 45 |
| 2.8 | CONCLUSION | 45 |
| 3 – Literature Review – Motivation | | |
| 3.1 | INTRODUCTION | 47 |
| 3.2 | INTRINSIC AND EXTRINSIC MOTIVATION | 48 |
| 3.2.1 | Traditional definitions | 48 |

| | | |
|-----------|--|----|
| 3.3 | PRACTICALITIES OF RESEARCH | 49 |
| 3.3.1 | Researcher anxiety and the quest for control | 49 |
| 3.3.2 | Novice-as-expert | 50 |
| 3.3.3 | The challenge of doctoral writing | 50 |
| 3.3.4 | Researcher as active meaning maker | 51 |
| 3.4 | CHOOSING SDT AS THE PREFERRED THEORY | 51 |
| 3.4.1 | Justifying the selection of SDT | 52 |
| 3.4.1.1 | Stage 1 – Synthesis of theories | 52 |
| 3.4.1.2 | Stage 2 – Content and process theories of motivation | 54 |
| 3.4.1.3 | Stage 3 – Self Determination Theory | 56 |
| 3.5 | SELF DETERMINATION THEORY | 56 |
| 3.5.1 | Free choice measure | 59 |
| 3.5.2 | The mini-theories of SDT | 60 |
| 3.5.2.1 | Cognitive Evaluation Theory | 60 |
| 3.5.2.2 | Organismic Integration Theory | 61 |
| 3.5.2.2.1 | External Regulation | 63 |
| 3.5.2.2.2 | Introjected Regulation | 64 |
| 3.5.2.2.3 | Identified Regulation | 65 |
| 3.5.2.3 | Causality Orientations Theory | 65 |
| 3.5.2.4 | Basic Psychological Needs Theory | 66 |
| 3.5.2.5 | Goal Contents Theory | 67 |
| 3.5.3 | Summary | 68 |
| 3.6 | ALTERNATIVE APPROACHES TO STUDYING MOTIVATION | 68 |
| 3.6.1 | Hierarchy of Needs | 68 |
| 3.6.2 | Two-Factor Theory | 70 |
| 3.6.3 | Job Characteristics Theory | 71 |
| 3.6.4 | Summary | 74 |
| 3.7 | PRIOR STUDIES: MOTIVATIONS & IMPEDIMENTS | 74 |
| 3.7.1 | Intrinsic Motivation | 75 |
| 3.7.2 | Extrinsic Motivators | 77 |
| 3.7.3 | Barriers to motivation | 80 |
| 3.7.4 | Summary of findings | 81 |
| 3.7.5 | Summary | 82 |

| | | |
|------------------------|--|-----|
| 3.8 | CONCLUSION | 83 |
| | | |
| 4 - Methodology | | |
| 4.1 | INTRODUCTION | 84 |
| 4.2 | THE RESEARCH UNION | 84 |
| 4.3 | DEFINING THE RESEARCH PHILOSOPHY | 85 |
| 4.3.1 | Epistemology | 85 |
| 4.3.1.1 | Epistemology and Self Determination Theory | 86 |
| 4.3.1.2 | Epistemology and the research study | 87 |
| 4.3.2 | Ontology | 88 |
| 4.3.2.1 | Ontology and Self Determination Theory | 88 |
| 4.3.2.2 | Ontology and the research study | 89 |
| 4.3.3 | Axiology | 92 |
| 4.3.3.1 | Research self | 93 |
| 4.3.3.2 | The role of the researcher | 93 |
| 4.3.3.3 | Statement of experience | 94 |
| 4.3.3.4 | Research selves | 95 |
| 4.3.3.4.1 | Research based selves | 95 |
| 4.3.3.4.2 | Brought selves | 96 |
| 4.3.3.4.3 | Situationally created selves | 97 |
| 4.3.3.5 | Methodological reflexivity | 97 |
| 4.3.3.5.1 | Creating project | 97 |
| 4.3.3.5.2 | Interviewing participants | 99 |
| 4.4 | METHODOLOGY | 100 |
| 4.4.1 | Judging the quality of critical realism research | 101 |
| 4.4.2 | Qualitative research | 102 |
| 4.4.2.1 | Grounded Theory | 104 |
| 4.4.2.1.1 | The process | 104 |
| 4.4.2.1.2 | Rejection of Grounded Theory | 105 |
| 4.4.2.2 | Phenomenological Studies | 105 |
| 4.4.2.2.1 | The process | 105 |
| 4.4.2.2.2 | Rejection of Phenomenological Studies | 106 |
| 4.5 | RESEARCH DESIGN | 106 |
| 4.5.1 | Case studies | 106 |
| 4.5.1.1 | Applicability of case study research to critical realism | 107 |

| | | |
|------------|---|-----|
| 4.5.1.2 | Case study design and selection | 107 |
| 4.5.1.2.1 | Single versus multiple case design | 108 |
| 4.5.1.2.2 | Single versus multiple | 108 |
| 4.5.1.2.3 | Holistic versus embedded | 109 |
| 4.5.1.2.4 | Intrinsic versus instrumental case design | 111 |
| 4.5.1.2.5 | Descriptive versus explanatory | 112 |
| 4.5.1.2.6 | Replication logic | 112 |
| 4.5.1.2.7 | Ensuring objectivity | 114 |
| 4.5.1.2.8 | Reliability | 115 |
| 4.5.1.2.9 | Construct validity | 115 |
| 4.5.1.2.10 | Internal validity | 116 |
| 4.5.1.3 | Pilot study | 118 |
| 4.5.1.3.1 | Selection of participants | 121 |
| 4.5.1.4 | Interviews | 122 |
| 4.5.1.4.1 | Likert scale | 124 |
| 4.5.1.4.2 | Card sort | 125 |
| 4.5.1.5 | Case study analysis | 126 |
| 4.5.1.6 | Thematic analysis | 128 |
| 4.5.1.6.1 | Familiarise self with data | 128 |
| 4.5.1.6.2 | Generate initial codes | 130 |
| 4.5.1.6.3 | Search for themes | 133 |
| 4.5.1.6.4 | Review themes | 135 |
| 4.5.1.6.5 | Define and name themes | 135 |
| 4.5.1.6.6 | Produce report | 135 |
| 4.5.1.7 | Cross-case analysis | 136 |
| 4.6 | CONCLUSION | 140 |

5 – Data Analysis

| | | |
|---------|--|-----|
| 5.1 | INTRODUCTION | 141 |
| 5.2 | PEN PORTRAITS | 142 |
| 5.3 | CROSS-CASE ANALYSIS | 145 |
| 5.4 | ACADEMIA – INITIAL AND CONTINUED MOTIVATION | 147 |
| 5.4.1 | Motivation to become an academic | 147 |
| 5.4.1.1 | Intrinsic motivators | 147 |
| 5.4.1.2 | Extrinsic motivators | 148 |

| | | |
|-----------|--|-----|
| 5.4.1.2.1 | Lifestyle | 148 |
| 5.4.1.2.2 | Opportunity | 149 |
| 5.4.1.2.3 | Improving education | 151 |
| 5.4.2 | Being an academic | 152 |
| 5.4.2.1 | Intrinsic motivators | 153 |
| 5.4.2.1.1 | Intellectual challenge | 153 |
| 5.4.2.1.2 | Novelty and variety | 155 |
| 5.4.2.2 | Extrinsic motivators | 156 |
| 5.4.2.2.1 | Working with colleagues | 156 |
| 5.4.2.2.2 | Working with students | 157 |
| 5.4.3 | Barriers and challenges | 160 |
| 5.4.3.1 | Time pressures | 160 |
| 5.4.3.2 | Academic snobbery | 163 |
| 5.4.3.3 | Career and personal development | 164 |
| 5.5 | KNOWLEDGE TRANSFER PARTNERSHIPS | 166 |
| 5.5.1 | The benefits and challenges of knowledge transfer | 166 |
| 5.5.2 | The relationship between Self Determination Theory and Knowledge Transfer Partnership engagement | 167 |
| 5.5.3 | Card sort – the story of a Knowledge Transfer Partnership | 168 |
| 5.5.4 | Knowledge | 172 |
| 5.5.4.1 | Knowledge sharing | 172 |
| 5.5.4.1.1 | Developing ideas | 173 |
| 5.5.4.1.2 | Knowledge acquisition | 174 |
| 5.5.5 | Partnerships | 175 |
| 5.5.5.1 | Teamwork | 176 |
| 5.5.5.2 | Being supportive and being supported | 177 |
| 5.5.6 | Further drivers for Knowledge Transfer Partnership engagement | 178 |
| 5.5.6.1 | Personality traits | 179 |
| 5.5.6.2 | Impacts | 182 |
| 5.5.6.2.1 | Making a difference | 183 |
| 5.5.6.3 | Benefits | 185 |
| 5.5.6.4 | Outputs | 189 |
| 5.5.6.5 | Successes | 190 |

| | | |
|---------|--------------------------------|-----|
| 5.5.6.6 | Rewards | 191 |
| 5.5.7 | Barriers | 195 |
| 5.5.7.1 | Academic reputation | 196 |
| 5.5.7.2 | Career | 197 |
| 5.5.7.3 | Administration and bureaucracy | 197 |
| 5.5.7.4 | Approval process | 198 |
| 5.5.7.5 | Personalities | 199 |
| 5.5.7.6 | Engaging with the company | 200 |
| 5.6 | CONCLUSION | 201 |

6 – Discussion

| | | |
|----------|--|-----|
| 6.1 | INTRODUCTION | 204 |
| 6.2 | KNOWLEDGE TRANSFER PARTNERSHIPS AND MOTIVATION | 204 |
| 6.2.1 | Evidence from the literature reviews | 205 |
| 6.2.2 | Evidence from the data analysis | 207 |
| 6.2.3 | Intrinsic and extrinsic motivators | 209 |
| 6.2.3.1 | Adaptations to the definition of intrinsic motivation | 209 |
| 6.2.3.2 | Motivated by a love of knowledge and learning | 212 |
| 6.2.3.3 | Engaging in knowledge transfer yields feelings of competency | 212 |
| 6.2.3.4 | Engaging in knowledge transfer promotes opportunities to act autonomously | 212 |
| 6.2.3.5 | Engaging in knowledge transfer supports the need to belong | 213 |
| 6.2.3.6 | Tangible rewards do not motivate | 214 |
| 6.2.3.7 | Knowledge transfer promotes feelings of relatedness to industry | 214 |
| 6.2.3.9 | Engaging in knowledge transfer is complementary to traditional academic norms | 215 |
| 6.2.3.9 | Engaging in knowledge transfer provides opportunities to connect research to teaching and learning | 216 |
| 6.2.3.10 | Engaging in knowledge transfer facilitates networking opportunities | 216 |
| 6.2.3.11 | Motivated by the opportunity to support the development of Associate and company | 217 |
| 6.2.4 | Barriers to motivation | 218 |

| | | |
|---------|---|-----|
| 6.2.4.1 | SDT and amotivation | 218 |
| 6.2.4.2 | Questions over the legitimacy of knowledge transfer as an academic activity | 219 |
| 6.2.4.3 | Balancing knowledge transfer activity with traditional academic activity | 220 |
| 6.2.4.4 | Environments where support for enterprise is lacking fail to promote optimal well-being for entrepreneurially inclined academics | 220 |
| 6.2.4.5 | The administration and management of Knowledge Transfer Partnerships hinders motivation | 221 |
| 6.2.4.6 | Career progression is not always clear with regards academics with entrepreneurial inclinations | 222 |
| 6.3 | RECOMMENDATIONS | 222 |
| 6.3.1 | Higher Education policy – Europe and UK | 223 |
| 6.3.2 | University and departmental level | 223 |
| 6.3.3 | Knowledge Transfer Partnership level | 223 |
| 6.3.4 | Individual motivation | 223 |
| 6.3.5 | Higher Education policy level | 226 |
| 6.3.5.1 | Greater consideration as to how academic reputation is measured is required, in order to address the inequalities between research academics and industry-engaged academics | 226 |
| 6.3.6 | University level | 226 |
| 6.3.6.1 | Consider formalising the university recognition process for Knowledge Transfer Partnership engagement, in order to address noted criticisms about career progression | 226 |
| 6.3.6.2 | Develop a campaign, designed for individuals and departments, to promote the benefits of Knowledge Transfer Partnership engagement | 227 |
| 6.3.6.3 | After surveying staff in order to identify issues with administrative systems related to Knowledge Transfer Partnership engagement, consider how processes can be improved to redress any imbalance | 228 |
| 6.3.6.4 | Identify those with intrinsic interest in engaging, or with experience in industry, and invite them to an event promoting Knowledge Transfer Partnerships | 228 |
| 6.3.7 | Department level | 229 |
| 6.3.7.1 | Provide less experienced academics with an experienced departmental mentor to advise with issues of industry engagement | 229 |

| | | |
|---------|--|-----|
| 6.3.8 | Knowledge Transfer Partnership level | 229 |
| 6.3.8.1 | Gather further evidence of the rate of Knowledge Transfer Partnership approval and associated management processes, in order to develop a strategy to address weaknesses in the administrative process | 229 |
| 6.3.8.2 | Offer guidance and develop strategies to challenge and address issues with project based working relationships | 230 |
| 6.3.9 | Individual level | 230 |
| 6.3.9.1 | Offer Knowledge Transfer Partnership academics the opportunity to participate in a publicity campaign designed at awareness raising in the academic community | 230 |
| 6.3.10 | Summary | 231 |
| 6.4 | CONCLUSION | 231 |

7 - Conclusion

| | | |
|-----------|--|-----|
| 7.1 | INTRODUCTION | 233 |
| 7.2 | MEETING THE AIM AND OBJECTIVES | 234 |
| 7.3 | CONTRIBUTION TO KNOWLEDGE | 235 |
| 7.3.1 | University-industry collaborations | 236 |
| 7.3.1.1 | Selection of participants | 236 |
| 7.3.1.2 | EU policy - motivation | 236 |
| 7.3.2 | Motivation theory | 238 |
| 7.3.2.1 | Self Determination Theory | 238 |
| 7.3.2.1.1 | Contribution to theory | 235 |
| 7.3.2.1.2 | Rigour and accuracy in data analysis | 239 |
| 7.3.2.1.3 | Stages of data analysis process | 240 |
| 7.3.2.2 | Comparison to prior research | 248 |
| 7.4 | LIMITATIONS OF THE RESEARCH STUDY | 249 |
| 7.4.1 | Difficult to generalise to a population | 249 |
| 7.4.2 | Selective sample – size of sample, location, and universities represented | 250 |
| 7.4.3 | Motivations known only of academics | 251 |
| 7.5 | DIRECTION OF FUTURE RESEARCH | 251 |
| 7.5.1 | Using study data for a larger scale study surveying all academics engaged in Knowledge Transfer Partnership activity | 251 |

| | | |
|------------------------|---|-----|
| 7.5.2 | Targeted sampling strategy to uncover female academics engaged in Knowledge Transfer Partnership activity | 252 |
| 7.5.3 | Study to determine the motivations of STEM academics not engaged in Knowledge Transfer Partnership | 253 |
| 7.5.4 | Identify Knowledge Transfer Partnerships where it is possible to study the motivations of all involved in the project | 253 |
| 7.5.5 | Research to understand whole project life-cycle, with a focus on motivation | 254 |
| 7.5.6 | Revisit the Likert Scale using appropriately judged phrases | 254 |
| 7.6 | CONCLUSION | 254 |
| APPENDICIES | | |
| 1 | Researcher prior experience | 256 |
| 2 | Interview structure | 259 |
| 3 | Case study protocol | 264 |
| 4 | Sample Data Analysis | 269 |

REFERENCES

Tables

| | Page |
|---|-------------|
| 1 4 modes of knowledge creation or conversion | 20 |
| 2 Knowledge matrix | 21 |
| 3 Comparison of knowledge transfer, sharing and exchange | 22 |
| 4 5 stages for processing new knowledge for innovation | 42 |
| 5 Theories of motivation | 53 |
| 6 Summary of five mini-theories of Self Determination Theory | 58 |
| 7 Taxonomy of regulated Extrinsic Motivation according to Self Determination Theory definitions of Extrinsic Motivation | 63 |
| 8 Summary of Intrinsic Motivators, Extrinsic Motivators and Barriers to Motivation from prior studies | 82 |
| 9 Descriptions of qualitative research | 103 |
| 10 Framework for replication logic | 113 |
| 11 Challenges to case study design and tactics to overcome | 114 |
| 12 Types of interview questions | 122 |
| 13 Likert Scale – qualities of engaged academics | 124 |
| 14 Card sort – available choice of words | 125 |
| 15 Excerpt 1: Initial codes | 129 |
| 16 Excerpt 2: Generate initial codes | 131 |
| 17 Stage 3: Search for themes | 133 |
| 18 Stage 4: Review themes | 135 |
| 19 Cross-case analysis of the effects of prior experience on individual intrinsic and extrinsic motivation | 139 |
| 20 Pen portraits | 142 |
| 21 Intrinsic and extrinsic reasons for becoming an academic | 147 |
| 22 Intrinsic and extrinsic motivators related to being an academic | 153 |
| 23 Barriers to motivation with regards to being an academic | 160 |
| 24 Card sort word selection | 169 |
| 25 Card sort – number of uses per word | 169 |
| 26 Intrinsic and extrinsic motivators for Knowledge Transfer Partnership engagement | 173 |
| 27 Intrinsic and extrinsic motivators for partnership working | 176 |

| | | |
|----|--|-----|
| 28 | Intrinsic and extrinsic motivators for Knowledge Transfer Partnership engagement, as related to personality traits | 179 |
| 29 | Intrinsic and extrinsic motivators, as related to impacts and Knowledge Transfer Partnership engagement | 182 |
| 30 | Barriers to motivation, as related to Knowledge Transfer Partnership engagement | 196 |
| 31 | Intrinsic and extrinsic motivators, and barriers to motivation – literature review | 205 |
| 32 | Intrinsic and extrinsic motivators, and barriers to motivation – data analysis | 207 |

Figures

| | Page |
|---|-------------|
| 1 Knowledge hierarchy | 19 |
| 2 Chesbrough's closed and open innovation | 24 |
| 3 Knowledge Transfer Partnership: role and relationships | 38 |
| 4 5 stages for processing new knowledge for innovation enacted through Knowledge Transfer Partnership | 44 |
| 5 Process leading to the selection of SDT | 52 |
| 6 The Self-Determination Continuum, with types of motivation and types of regulation | 62 |
| 7 Maslow's Hierarchy of Needs | 69 |
| 8 Herzberg's Two-Factor Theory | 70 |
| 9 Hackman and Oldham's Job Characteristics Model | 72 |
| 10 The Research Onion | 85 |
| 11 Popper's Three Worlds | 91 |
| 12 Holistic and embedded case study design | 110 |
| 13 Individual case studies embedded into research design | 111 |
| 14 Relationship between prior research findings and Self Determination Theory | 120 |
| 15 Relationship between concepts, showing embedded case studies | 127 |
| 16 Sample card sort exercises by participants | 171 |
| 17 Summary of data collected | 203 |
| 18 Organising intrinsic motivation data | 210 |
| 19 Tripartite taxonomy of intrinsic motivation | 210 |
| 20 Barriers to motivation cycle | 218 |
| 21 Recommendations at operational level | 225 |
| 22 Process of data analysis | 240 |
| 23 Motivation continuum grid | 241 |
| 24 Concept map | 244 |
| 25 Level 7 collation of responses | 245 |
| 26 Innovation, knowledge and knowledge transfer interaction, as supported by basic needs | 247 |

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Abstract

This research study is designed to elicit an understanding of what motivates academics engaging in Knowledge Transfer Partnerships (KTPs). KTPs are a mechanism used by universities to transfer knowledge to business and industry, but there is very little evidence of why academics engage in the activity, and how they find it motivating.

Using a qualitative case study approach, this study applies the principles of Self Determination Theory (SDT) to understand intrinsic and extrinsic motivation. SDT is an increasingly popular theory of motivation, but has had little application in the field of knowledge transfer, and no evidence was found of its application to the field of KTPs. This provides a unique approach to, and opportunity for, understanding individual academic motivation in the context of KTPs.

SDT proposes a motivation continuum where intrinsic motivation is the most autonomous behaviour, and external regulation the most controlled. They argue that individuals need to feel competent and able to behave autonomously, if they are to be intrinsically motivated. Furthermore, where the environment is supportive, they are much more likely to feel they can behave autonomously, and for their behaviour to be the most autonomous form of extrinsically motivated behaviour. SDT studies typically are quantitative, and take place in more controlled settings, although increasingly there is evidence of qualitative studies being conducted. In the case of this qualitative research study, thematic analysis is used to identify a series of themes, which are designed to enable an exploration and explanation of academic motivation. This evidence, along with secondary data, is designed to contribute to further understandings of SDT and individual academic motivation in the context of KTPs.

The overall purpose is to provide a series of recommendations designed to improve the relationships between academics engaging in KTPs, the universities supporting them, and the higher education policy environment.

1 – Introduction

1.1 INTRODUCTION

The focus of this research study is on understanding and evaluating the motivations of academics who are engaged in Knowledge Transfer Partnership (KTP) activity. KTP is a popular mechanism for knowledge transfer but it needs motivated individuals, specifically academic staff, who are willing to engage with the business problems in order to develop innovative solutions for business productivity, growth and competitiveness. The study will examine the intrinsic motivations, extrinsically regulated motivations, and barriers to motivation, for the purpose of enhancing engagement.

European and national policy is supportive of initiatives that drive innovation and growth, of which KTP is an example. Innovation is broadly defined as the creation of new products, processes, and services, which contribute to business growth. KTP projects seek to develop innovative responses to business problems by employing knowledge from the knowledge base, normally a Higher Education Institution (HEI). Individual academics represent the knowledge base to the business, and their role is to transfer knowledge to the business, in order to support the business to be more competitive, to improve their profits, and to be more productive. There are recognised issues with the translation of knowledge and the process by which it is transferred. Common issues include the fact that academic and business time-scales do not match. Universities are not always able to respond to research requests at the speed at which industry requires, and consequently business seeks alternative avenues, or choose not to follow a path of activity because support is unavailable. Another problem is that there are failures in the relationships between academics and business, because they are unable to communicate in a language both understand. This leaves businesses feeling that an 'ivory tower' mentality exists within the universities. These challenges can affect both business, and academics, and the purpose of the research study is to gain a better understanding of what challenges individual academic motivation during KTP engagement, and draw recommendations on how to improve and change the process, so that academics are left feeling more satisfied, and universities experience enhanced participation.

It is recognised in policy that if academics are to be central to this process they need to be motivated by the engagement. European policy, particularly, recognises that motivating academics who collaborate with industry is important for productivity and growth. They suggest providing opportunities for academics and business to partner, and offer secondments to researchers. They recognise that the opportunity for academics to collaborate with industry especially for those academics with experience in industry, or with entrepreneurial inclinations, could be hugely motivating. To support this they also recommend that universities have career development and incentive policies to support and encourage knowledge transfer, and skills development. In part, the Research Excellence Framework (REF) was introduced to support knowledge transfer. REF is interested in the impact research has on society, and this is predominantly about recognising academics producing research papers cited in the highest ranking journals. Academic reputations and career progression are increasingly based on the ability of academics to turn their research into papers suitable for the REF. Due to the sensitive nature of some research, KTP activity is not always suitable for citing in research papers because there is the danger that businesses may wish to hold onto the intellectual property. Consequently, academics involved in KTPs might not be able to enjoy the same incentives and progression as researchers who are more inward facing.

The KTP programme is

“Europe’s leading programme helping businesses to improve their competitiveness, productivity and performance through the better use of the knowledge, technology and skills that are available within the UK knowledge base”

(Innovate UK, 2014, p. 3)

It is the collaboration between a knowledge base, usually a university, a business, and an Associate. An academic is appointed to lead the project, although ideas and innovations occur from partnering with the business, and the Associate, usually a graduate, acts as conduit between academic and business.

This research study is interested in the role of the academics involved in projects, and seeks to understand their motivation for engagement, and what it is about the engagement they find motivating. Barriers to motivation are also considered and how these barriers affect academic involvement in projects. Understanding motivation is important if

“...a central mission of scholars...is to conduct research that both advances a scientific [management, societal] discipline and enlightens practice in a professional domain”

(Simon, 1976 cited in: Van de Ven, 2007, p. 1)

because if academics are to be innovative, and transfer knowledge, they need to find the activity intrinsically interesting, and extrinsically rewarding.

KTP engagement contributes to UK growth, productivity, and competitiveness, through the appointment of new staff, increased exports, investments in technologies, and improvements to annual profits. Between the period 2013-14 there were 712 KTPs and the majority were 'classic' projects lasting 2 years. Only 49 projects never saw a start date, suggesting that the KTP programme is “well liked” (Regeneris Consulting, 2010, p. 4) by those involved. 267 partnerships were completed between the year 2013 and 2014 and 61% of those were assessed as being 'outstanding' or 'very good' contributions to meeting the project objectives. This was an improvement on the previous year, with 55% outstanding or very good, and Innovate UK suggests this demonstrates that KTPs continue to “...deliver above and beyond the original project objectives” (Innovate UK, 2014, p. 8).

15 academics, from newer universities based in the north and south east of England, have been interviewed as part of this research study, with the purpose of determining what they find intrinsically motivating about engagement in KTP activity. The focus is on what they find interesting, enjoyable, and satisfying, and how this affects their behaviour. Self Determination Theory, a meta-theory of motivation which considers social and organisational contexts, is used to explore intrinsic motivation, but also provides a motivation continuum (Gagne & Deci, 2005) to explore extrinsic motivation.

They posit that extrinsic motivation does not have to have a thwarting effect on intrinsic motivation, and that there are versions of extrinsic motivation, of which the most autonomous, (that is the activity which is engaged in out of personal volition), is least controlled by external factors. Delivered in a supportive environment, academic motivation to engage in KTP activity, can meet needs for relatedness (the need to feel part of a group), competence (the need to feel able to do something), and autonomy. These are the needs, argue SDT theorists that self regulated and self determined individuals need to yield positive, and affective behaviour.

Following this introduction a justification for the research, followed by a statement of the aim and objectives, and discussion of the research methodology will take place. The chapter concludes by providing an overview of the structure of the thesis.

1.2 JUSTIFICATION FOR RESEARCH

At the beginning of her Doctoral study the researcher was invited to participate in a study tour to examine examples of community outreach, at universities in the mid-West of United States. Before the visit she had decided she was interested in examining KTPs, but it was from discussing examples of outreach that that the question of “why are academics motivated by engagement?” was identified as an interesting research question. of which there was little research generally, and no research specific to KTPs and academic motivation. This question also reflected the researcher's prior experience as a Research Assistant on a large, complex, publicly funded project. At several stages she had questioned, and was interested in understanding, the motivations of the academics involved, as well as her own motivation and that of the other Research Assistants. These experiences combined to present themselves as an interesting research problem, and particularly because academic motivation to engage in KTP activity had not been researched.

The research interest aligned well to the drivers for KTP activity, which include contribution to competitiveness, business growth, and productivity. For a project to achieve these objectives those engaged need to be motivated to want to remain working on the project. Prior research about academic motivation and engagement in university-industry collaborations was undertaken, in order to identify potential

motivators, but it was quite clear that there was a predominance of literature focused on academic motivation related to patenting, and research commercialisation. There was no evidence of research identifying motivation to engage in KTPs, and very little general evidence of research, except research papers, which used a KTP project as an example of innovative practice, or application of research. Research related to KTPs has tended to be in terms of official reports, commissioned by Innovate UK, and focused on impacts and best practice (Innovate UK, 2014; National Centre for Universities and Business, 2012; Regeneris Consulting, 2010; Momenta, 2005), although there has been brief comment made about academic motivation (Regeneris Consulting, 2010; Momenta, 2005). This, therefore, presented an opportunity to investigate an understudied area of research, from which there was the potential to make recommendations about the process, which could have a societal benefit.

The researcher sought a theory of motivation which would accommodate the social and organisational settings of universities, and university-industry collaborations, but would also account for individual needs. Self Determination Theory (SDT), a meta-theory in socio-psychology, presented itself as a suitable theory. SDT explores intrinsic and extrinsic motivation and the additive effects of extrinsic rewards on intrinsic motivation. Generally research has taken place in laboratory conditions and has been applied to settings in education, focusing, for example on educational attainment, or language learning; in sports psychology; and in health and nursing studies. Apart from studies by Lam (Lam, 2007; Lam, 2010), which focused on research commercialisation at research intensive universities, there have been no attempts to apply it to university-industry collaborations. From this perspective, this study offers a contribution to the developing field of SDT. SDT theorists have developed a series of questionnaires and tool kits and have developed a Motivation Continuum (Gagne & Deci, 2005). As this is not a psychology thesis, but instead an equally valuable, generalised understanding of motivation, in the context of university-industry collaborations, only the Motivation Continuum is of interest. This is because it provides a means of structuring evidence of intrinsic and extrinsic motivation, which in turn helps frame the analysis of interview data, for the purposes of cross-case analysis.

1.3 AIMS & OBJECTIVES

The purpose of the research study is to understand the motivations and barriers to motivation for academics engaging in KTP activity. By doing so, there will be the identification of key issues of commonality, difference, and concern, and together these will be used to determine a series of recommendations aimed at enhancing participation. The aim of this study is therefore

in the context of Knowledge Transfer Partnerships, evaluate the motivations of individual academics, for the purpose of making recommendations to enhance participation

Previously, as suggested, motivation is considered in terms of it being intrinsic to the individual, meaning the behaviour comes from within and is not controlled by external forces; or extrinsic, meaning external influences administer the 'reward' and it is for the person to perceive whether they feel controlled by the 'reward.' Case studies of KTP engagement, based on experiences of individual academics, are analysed, and the data from the cross-case analysis scrutinised and discussed in light of intrinsic and extrinsic motivation. Recommendations about how to enhance participation, how to ensure the programme motivates the academic, and how the universities might successfully support academic staff, are also provided. The research objectives illustrate how this will be achieved

- understand why the academic is attracted to, and motivated by, involvement in KTP activity;
- evaluate the intrinsic and extrinsic motivators for KTP activity and understand the barriers to motivation;
- provide a series of recommendations which build upon the benefits, and address the barriers to motivation, for the purpose of making engagement more motivating for the academic, and to ensure more successful collaborations for universities

1.4 RESEARCH METHODOLOGY

The process of the research methodology follows the principles of the “research onion”

(Saunders, Lewis, & Thornhill, 2009), whereby layers of the methodology are peeled away to reach the core, that is the data collection and analysis.

The first layer to consider is the research philosophy, specifically the epistemology, ontology, and axiology. The philosophical approach adopted is critical realism. Critical realism posits a view that there is a real world to discover, but there will always be an imperfect understanding of it because many of the aspects are abstract. This is the epistemological position. The ontological position holds that the reality, as we understand it, is real but imperfect, which is different to the positivist approach that claims reality is real, or the constructionist view that there are multiple realities, constructed locally and specifically, to the individual.

Critical realism was chosen because it has some correspondence to positivism (the predominant philosophical stance adopted by SDT studies), and because it is less interested in generalising to a population because it is not known what motivates and thwarts intrinsic and extrinsic motivation of academics, in the context of KTP activity. Critical realism also places emphasis on understanding the multi-layered nature of society, which means it can be accommodating of SDT studies which considered the multi-faceted motivation of individuals. The ontological position means that the researcher is able to understand the values and beliefs of the individuals, whilst appreciating the impact that her own experiences could have on her interpretation of the findings. Consideration can be given to the effect cultural and social institutions can have on motivation. This last point is particularly important when SDT is considered. This theory is interested in the impact of society and organisational culture, and the ontological position means that it is possible to move beyond just individual perceptions, or an acceptance that reality is real and apprehensible.

Axiology considers the role of the values of the researcher and the impact these might have on their research. The researcher was interested in discovering the intrinsic and extrinsic motivations and felt the most appropriate approach was to conduct semi-structured interviews. Analysis and discussions were dealt with fairly, without reference to the researcher's own experience of engagement in a publicly funded research project designed to transfer knowledge between universities and business.

After considering the research philosophy, attention turned to the methodology. As suggested, this is a qualitative study. It uses a case study approach (Yin, 2009), and semi-structured interviews to elicit individual academic perceptions of their intrinsic and extrinsic motivations. Case studies sit well with critical realism because they accept it is possible to gain access to the world's of individuals, and sit well with SDT because case studies tend to focus on contemporary issues where the relationship between factors has not been established. A thematic analysis, following the principles of Braun and Clarke (Braun & Clarke, 2006), is then conducted in order to better determine the intrinsic and extrinsic motivations, and barriers to motivation.

1.5 STRUCTURE OF THESIS

The purpose of this section is to provide details of the contents of each chapter, and to justify why each chapter is included in the thesis.

1.5.1 Introduction

The purpose of the introduction is to set the terms for the study. After introducing KTPs, and identifying why it is important and relevant to consider individual academic motivation, in the context of KTPs, justification is given for conducting the research and aim and objectives are stated. Research methodology is then considered before details are provided of the contents of each chapter.

1.5.2 Chapter 1 – Literature Review – Knowledge Transfer Partnerships

Whilst the introduction provided an overview of KTPs, the purpose of this chapter is to provide details about impacts, benefits, and processes, as well as to understand how innovation and knowledge are intrinsic to KTPs. Innovation and knowledge are defined in order to provide a fuller understanding of the concepts, and to identify why they are applicable to studies of KTPs. KTPs contribute to the growth, competitiveness, and productivity of the country but require a supportive policy environment in which to deliver and succeed. This chapter also considers European and national policies of innovation and knowledge transfer, identifying key drivers, and incentives designed to motivate academics to engage in university-industry collaborations.

1.5.3 Chapter 2 – Literature Review – Motivation

The second part of the literature review focuses on developing a definition of motivation and on understanding the theory adopted for this research study. Definitions of intrinsic and extrinsic motivation are made initially, as is an acknowledgment of the difficulties facing the researcher during the writing up process. Self Determination Theory (SDT), a meta-theory of motivation, is then turned to. It acknowledges the importance of social and environmental contexts, and posits that motivation exists on a continuum, from intrinsic, self-determined, to extrinsic, externally regulated and controlled behaviour. SDT is the theory adopted for interpreting the data from this study, but it was also felt important to reflect upon some other theories of motivation, in order to understand why SDT was thought to be the most appropriate. The chapter concludes with a discussion of intrinsic and extrinsic motivation as well as barriers to motivation for academics engaged in university-industry collaborations. The discussion is not specifically about KTP, but rather an opportunity to consult prior research from studies of research collaborations, and to identify commonalities which can later be compared to data from the research study.

1.5.4 Chapter 3 – Methodology

The literature review identified key issues in the theory and application of innovation and knowledge, and key factors about KTPs, before attention turned to understanding motivation, and SDT. Before progressing onto documenting the data collection process, it was felt important to stipulate, and justify, the research philosophy. Critical realism is the philosophical position adopted for this study, and it is different from that of quantitative, laboratory studies, which adopt a positivist philosophy and are typical to SDT studies. The researcher also explains how she is able to connect with the research participants because of her own experience as a research assistant on a university-industry collaborative project. The research methodology adopted was multiple case studies, using semi-structured interviews to obtain data. These interviews were interpreted using a thematic analysis approach, which was used to identify intrinsic and extrinsic motivators, and barriers to motivation for individual academics engaging in KTP activity.

1.5.5 Chapter 4 – Data Analysis

The purpose of the research study is to determine individual academic motivations, in relation to KTP engagement, and interviews were conducted as a means for academics to express how they are motivated, and the effect it has on their engagement in KTP activity. This chapter takes data from the cross-case analysis and uses it to explore intrinsic and extrinsic motivation, and barriers to engagement, for academics engaging in KTP activity. SDT is used to reference data obtained to a psychological theory which is accommodating of individual needs, and social and cultural factors. After providing pen portraits which give basic biographical data about each participant, motivations prior to KTP activity are examined. Academics were asked what motivated them to become an academic, and why they remain motivated by a role in academia. Excerpts from the interviews with academics are used to demonstrate commonality of ideas, variety of responses, and, individual terms of reference. After establishing their motivations, and barriers to motivation, attention is turned to specifically discussing KTPs. Again, the discussion is structured so as intrinsic, then extrinsic motivations, are identified, ending with barriers to motivation. Appropriate sub-sections exist within the discussion in order to provide focus for specific issues. The chapter concludes by providing a model which illustrates motivations related to higher education policy, university and departmental level, KTP, and individual level. This model is used to help in the development of recommendations for improving the KTP process, which is discussed further in the following chapter.

1.5.6 Chapter 5 – Discussion

This chapter seeks to discuss the key issues raised in the data analysis chapter, and firstly compares them to findings from the literature review. The data analysis chapter and the literature reviews both identify a series of themes evident in the intrinsic motivations, and extrinsic motivators of academics engaged in university-industry collaborations, and specifically KTP activity. Both chapters also identify a series of barriers to motivation and it is these particularly that are addressed in the recommendation section. A series of nine recommendations are made which build on positives identified from the data analysis, and recognise the importance of using motivated academics as examples as opposed to those academics that are perhaps reticent about KTP activity. Likewise, as suggested, there are issues that could thwart motivation that needed addressing, particularly at a policy, and university or

departmental level. There are also issues identified in relation to the KTP process, which were addressed via recommendations. The purpose of the recommendations is to provide guidance on how to maintain the commitment of individual academics, ensuring they remain intrinsically and extrinsically motivated, and for the universities to be able to enhance participation, and thus ensure greater impact in their communities.

1.5.7 Conclusion

The conclusion draws together the key issues raised in the study, focusing how the aim and objectives were met, what contribution was made to research, the limitations of the study, and directions for future research.

1.6 CONCLUSION

The purpose of the introduction has been to set the parameters for the research study. The focus of the study is individual academic motivation, in the context of KTP, and it was not possible to find evidence of research in this area. There were examples of research in the area of individual academic motivation, and university-industry collaborations and knowledge transfer, but the focus tended to be on research commercialisation, patenting, or the motivation of research-intensive scientists. This therefore represents a gap in current research, and a justification for the research study.

SDT, a theory of motivation which recognises the importance of the social and organisational environments, was selected to be used to evaluate individual motivation. It posits that intrinsic motivation flourishes in a supportive environment, where an individual is able to act autonomously, their competencies are recognised, and they feel connected to the referent group. It also proposes that extrinsic motivation exists on a continuum, and when it is least controlled by external influences, behaviour is integrated into the individual. This theory was appropriate for understanding motivation to engage in KTP activity because knowledge transfer is about developing and recognising competencies, where collaboration with the business and Associate meets the need for relatedness, and academia provides an environment where academics are able to make decisions on how they should conduct their research, thus

meeting their need for autonomy.

Critical realism was adopted as the research philosophy because, unlike traditional SDT studies that adopt positivist philosophies, this is a qualitative study and is interested in understanding the perceptions of individuals. The realities under consideration are also multi-faceted and therefore match critical realist approaches which believe that reality exists in the physical, mental, and cultural worlds.

The goal of the research study is to examine intrinsic and extrinsic motivators for individual academics, with the purpose of using this evidence, and that related to any issues that thwart motivation, in order to develop a set of recommendations for individuals, organisations, and policy makers. These recommendations are designed to support and enhance greater collaboration in KTP activity. Policy also seeks to encourage participation in knowledge transfer, by offering incentives, and this study examines what academics find extrinsically motivating, and whether the type of incentives policy recommended is applicable for those academics engaging in KTP activity.

2 – Literature Review – Knowledge Transfer Partnerships

2.1 INTRODUCTION

The purpose of this chapter is to provide definitions of, and understanding related to, Knowledge Transfer Partnerships (KTP), but knowledge and innovation will also be considered, because they have an important role within KTP activity. Furthermore, because knowledge transfer between universities and industry operates within a complex policy environment, UK and European level policy relating to academic engagement needs to be considered. The literature review is considered over the following two chapters. The purpose of the first chapter is

- to outline the history and key benefits of the KTP programme;
- to define innovation and knowledge, focusing on theoretical approaches and historical developments, and discussions about transfer, sharing, and exchange of knowledge;
- to outline and provide an understanding of relevant European and UK policy relating to academic engagement with industry;
- to consider KTPs, identifying relationships, motivations for academics and Associates, and business, and the benefits, impacts and drivers of engagement; and,
- to reflect on examples of prior research concerned with university-business collaborations to determine intrinsic and extrinsic motivators, and barriers to motivation, for individual academics

2.2 INTRODUCTION TO KNOWLEDGE TRANSFER PARTNERSHIPS

The focus of this research study is Knowledge Transfer Partnerships (KTP). KTPs are described as,

“...Europe’s leading programme helping businesses to improve their competitiveness, productivity and performance through the better use of the resources that are available within the UK knowledge base”

(Innovate UK, 2014, p. 3)

They are defined as,

“A relationship formed between a company and an academic institution ('Knowledge Base' partner), which facilitates the transfer of knowledge, technology and skills to which the company partner currently has no access”

(Technology, 2007)

This is a national scheme, and the first examples were in 1975 and were called Teaching Company Schemes (TCS). The name changed in 2003 to KTPs and, since 2007, the programme has been managed by the Innovate UK (previously known as Technology Strategy Board (TSB)). Between 2013-2014 there were 712 KTP projects, which created around £211 million in changes to annual profits of UK companies (Innovate UK, 2014, p. 5).

2.3 DEFINITIONS OF KNOWLEDGE AND INNOVATION

The processes, criteria, and benefits of KTP activity will be explored in subsequent paragraphs. Before this, the intention is to define the terms 'innovation' and 'knowledge.' Innovation and knowledge sharing are key to the process and purpose of KTPs, and it is important to have clarity of definition as both terms can be subject to misuse or misunderstanding.

2.3.1 Innovation

The purpose of a KTP is to improve business competitiveness and productivity and, in doing so improve their performance by applying newly gained knowledge to current situations, or by developing new responses to problems. This is innovative practice and it is important to understand what the term 'innovation' means, so it can be applied to understandings of university-business collaborations.

Innovation is a dynamic process; playing out over time in a series of events, both managed (Keegan & Turner, 2002) and unmanageable, due to the sheer dynamic complexity of the context. It is also a misused term, often confused with, but related to, the terms 'creativity', 'invention', 'design', and 'change' (O'Sullivan & Dooley, 2009, p.

4).

Definitions of innovation include,

“...the effort to create purposeful, focused change in an enterprise's economic or social potential” (Drucker, 2002)

which suggests that making a difference to the company is an important part of the innovation process. Another definition suggests that innovative practice revolves around adding value to the organisation, and contributing to their knowledge base. This definition also more closely defines the processes behind a KTP.

“Applying innovation is the application of practical tools and techniques that make changes, large and small, to products, processes, and services that result in the introduction of something new for the organization that adds value to customers and contributes to the knowledge store of the organization.”

(O'Sullivan & Dooley, 2009)

A third definition,

“An innovation is typically defined as the development and implementation of new ideas, and research findings are innovations when they are perceived by potential adopters to represent new ideas for theory and practice”

(Van de Ven, 2007, p. 241)

focuses on the transfer of knowledge, in this case through “engaged scholarship,” a term adopted by Van de Ven to explain participative research, where perspectives of clients and stakeholders are considered in order to understand a complex social problem (Van de Ven, 2007, p. 1). Like O'Sullivan and Dooley's definition it is relevant to understanding innovation in KTP activity because of the focus on knowledge transfer.

As suggested earlier, innovation also relates to invention, creativity, growth, and change. O'Sullivan and Dooley consider these concepts in relation to innovation and

suggest that invention is different from innovation because innovation is more than creating a product; innovation is a process of change and added value for the recipient of the knowledge. The change is always positive because there is added value, which explains why the term 'change' cannot be used interchangeably with 'innovation', because change can be positive or negative. Innovation creates something new, but it is not creativity. Creativity is defined as “the capability or act of conceiving something original or unusual” (Sloane, 2012). It is important for the KTP process for the idea to be creative and original, in order for it to be brought to market, but creativity is a different concept to innovation. Innovation is also a specific function of entrepreneurship, according to Drucker. He comments that innovation is,

“...the means by which the entrepreneur either creates new wealth-producing resources or endows existing resources with enhanced potential for creating wealth”
(Drucker, 2002)

Innovation is therefore important for business growth. Growth can be seen in terms of improvements to process to reduce costs or increased turnover but it is innovation, in terms of improvements to management or production processes, that contributes to growth which is important to recognise in terms of KTP activity.

The changes made to the business from innovative practice contribute to business growth. Inventions and creativity, created from knowledge gained and knowledge shared, are important aspects, particularly of the KTP process, and it is these positive behaviours that drive innovation in KTP projects.

2.3.2 Knowledge

The purpose of this section is to develop a meaningful definition of knowledge, applicable to knowledge transfer, in the context of KTP. The Collins English Dictionary defines knowledge as “...the facts, feelings and experiences known by a person or group of people” (Collins English Dictionary, 1995). It is a human-decision making processes involving cognitions, thus knowledge can be found and used in any form, with the recipient's mental processes dictating how the knowledge is used.

There are different approaches to understanding knowledge, which are separate from the definition above. It is possible to consider knowledge from a philosophical, phenomenological, and psychological viewpoint. Philosophical interpretations can take either revolutionary or an evolutionary approach to understanding knowledge. In 1962 Thomas Kuhn (1962) wrote, *The Structure of Scientific Revolutions*, (reprinted in Bar-Am, 2014) which introduced the idea of revolutions in scientific understanding. He stated that theories and explanations of knowledge, whilst maintaining constant progress, occasionally experienced a revolution where new science emerged. These 'paradigm shifts' allowed scientists to ask questions and move beyond mere puzzle solving. Once there was a shift to another paradigm it was not possible to return to the previous paradigm – they were incommensurable – because language had changed, questions asked were now not valid, and new world views had been established. An alternative, contrasting approach, was offered by Karl Popper (1978). For Popper there are three distinct worlds where knowledge exists; the physical universe (World 1), the subjective world (World 2), and artefacts of the first and second worlds (World 3). These worlds interact, meaning that physical and mental states can co-exist. World 3 are the products of thoughts, and can include theories, stories, and social institutions.

There is also the phenomenological approach to knowledge. Phenomenology, founded by Edmund Husserl, is the philosophical study of experience. He published *Ideas pertaining to a pure phenomenology and philosophical phenomenological philosophy*, in 1913 (reprinted Husserl, 1983) and determined that an individual's interpretation depends upon the event experienced, and the individual's prior experiences. The idea that consciousness is an empirical phenomenon that can be tested quantitatively by the methods of natural science is rejected (Mickunas & Stewart, 1974, p. 4)

Knowledge can also be considered from a psychological viewpoint following, for example, Jean Piaget's (Piaget, 1977) stages of cognitive development. Knowledge has to be personal, relevant, and meaningful, with adults having passed through the four stages of cognitive development to reach a point where they no longer had any developmental stages, but instead they developed increasingly complex schema based on the additional knowledge they gained. Part of Piaget's cognitive development model included two complementary processes of adaptation called accommodation

and assimilation. An individual gains knowledge from the outside world, and is either able to internalise it without changing it, so assimilates it, or, because the new knowledge does not fit into their prescribed understanding they have to accommodate it by adapting to the changes.

These approaches to knowledge highlight that knowledge is concerned with human-decision making and cognition. Acquiring knowledge means individuals have to reason and ask questions, and perceive how they will use the knowledge in order to share the gained knowledge.

2.4 KNOWLEDGE MANAGEMENT

Knowledge needs to be effectively managed if it is to contribute to innovations, and to growth of the nation. Anand and Singh (2011) show how knowledge management has evolved from a new, untested concept to one which is now used for competitive advantage. They conclude that there have been 3 distinct periods of knowledge management:

1. *1990 - 1995*: establishing the fundamentals of knowledge management (Wiig, 1993) ; (Liebowitz & Beckman, 2000);
2. *1996 – 2002*: implementation of knowledge management systems. Recognised as important for business development (Davenport & Prusak, 1997); (Chase, 1997a); (Chase, 1997b)
3. *2002 to present*: qualitative approaches considering cultural, social and political factors. Knowledge is crucial for competitive advantage (Checkland & Holwell, 1998); (Nonaka, Konno, & Toyama, 2001); (Wang & Noe, 2010).

This final period is particularly relevant to this research study because the criterion for KTPs stipulate that knowledge (and associated skills, and developed products and processes) is to be used for competitive advantage.

2.4.1 Knowledge hierarchy

Wang and Noe (2010) comment that many researchers use the terms knowledge and information interchangeably seeing "...knowledge as information processed by

individuals including ideas, facts, expertise, and judgements...” (Wang & Noe, 2010, p.117) but it is generally accepted that knowledge, information and data are separate parts of a continuum or hierarchy. Data relates to discrete objective facts. In a project for example, some data will remain on a spreadsheet and will never be subjected to interpretation which would make it into information. This interpretation gives the data context, it categorises it and collates it into usable information. When individuals make connections between different sets of information and then converse, discuss and debate the nature of the information and transfer, share and exchange it between other individuals, information then becomes knowledge.

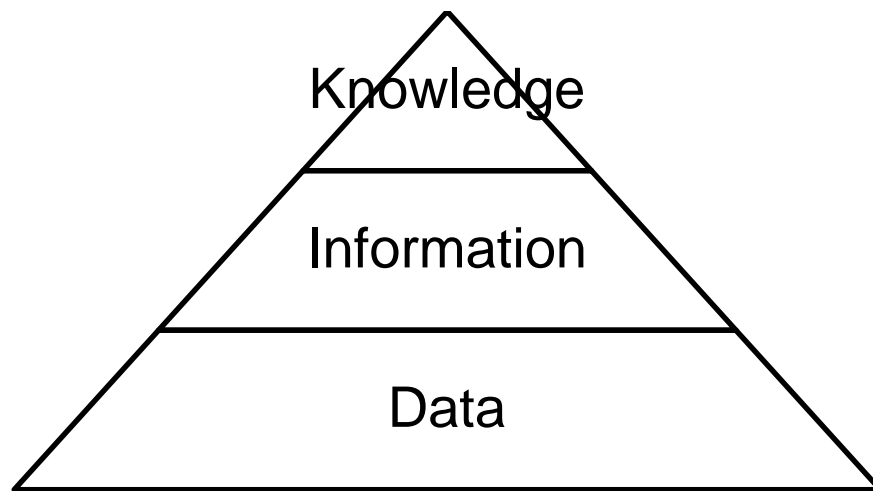


Figure 1 - Knowledge hierarchy

Challenges to the knowledge hierarchy can be seen in Piaget's (Piaget, 1977) concept of assimilation and accommodation. Assimilation appears to fit with the knowledge hierarchy – data and information from outside is assimilated and turns into knowledge. The individual however is presented with a challenge when data and information does not fit to their prescribed understandings. Data and information has become personal and the process of accommodation challenges previous held understandings which could be uncomfortable for the individual.

2.4.2 Theory of knowledge overview

Knowledge acquisition is a complex cognitive process subject to individual perceptions, associations, reasoning and also communication. Knowledge that is gained and shared can be either implicit or explicit and this division is central to theories

of knowledge. The table below represents the relationship between tacit and explicit knowledge creation or conversion, according to Nonaka and Takeuchi (1995).

| | <u>To</u> tacit knowledge | <u>To</u> explicit knowledge |
|--|-------------------------------------|--|
| <u>From</u> tacit knowledge | <i>Socialisation</i> | <i>Externalisation</i> |
| <u>From</u> explicit knowledge | <i>Internalisation</i> | <i>Combination</i> |

Table 1 - 4 modes of knowledge creation or conversion (Nonaka and Takeuchi, 1995, pp.63-69)

Tacit knowledge refers to knowledge which is individual to the person. Interpretation is based on their experience and understanding and, in doing so, becomes socialised in the individual. Furthermore, as Boisot (1998) explains, tacit knowledge can be internalised because everyone understands it already; internalised because no one understands it; and difficult or impossible to make explicit. Explicit knowledge, on the other hand, is more obvious and can be communicated through language and can be captured in textbooks, processes or technologies. For this knowledge to become tacit for the individual it has to be internalised. When the individual makes their tacit knowledge explicit, for example if they were to write an academic paper about a particular process, they are externalising this knowledge. Explicit knowledge communicated to other individuals has to go through a process of being socialised, internalised and externalised before another individual is able to recognise and use it as explicit knowledge.

Other ways to define knowledge include situated, partial and latent knowledge. Situated knowledge refers to knowledge which is specific to a situation and in some respects is a form of tacit knowledge because it often takes the form of language, cultural practices and traditions. Partial knowledge refers to the idea that it is not possible to know everything there is to know about a subject. As Boisot (1998) explained, with tacit knowledge some knowledge is difficult or impossible to make explicit. Latent knowledge refers to knowledge that has yet to be harnessed. Shin et al., (2001) comment that there tends to be an over-emphasis on the power of tacit

knowledge, but argue that instead of focusing on what cannot be articulated, it is better instead to focus on what has not been articulated. It is then the task of knowledge managers to identify ways to use tacit (and explicit) knowledge so that it can become explicit knowledge.

There are also three main schools of thought with regards to how knowledge is theorised. For some knowledge is situated in the mind; for other it is a process; and others regard it as an object. Shin et al (2001) used definitions from a variety of sources to develop taxonomy of knowledge, which has been adapted below:

| Focus | Definition | Tacit or Explicit |
|---------|---|-------------------|
| Mind | Instinctive to the individual; based on experience | Tacit |
| Process | Knowledge that is dependent on conceptual skills and cognitive abilities to interpret; represented through speech | Explicit |
| | Instinctive knowledge of social process and organisational systems | Tacit |
| Object | Knowledge made readily available through signs and symbols (e.g.: books, data bases etc) | Explicit |

Table 2 - Knowledge matrix (Adapted from: (Shin et al., 2001)

This purpose of this section has been to provide an overview of the different theories of knowledge. Whilst the particular focus of the research study is on the knowledge which is transmitted, there are still some useful points to explore further. It will be interesting to see, for example, how tacit knowledge from individuals in the Partnership is made explicit. Related to motivation it will also be interesting to see if this process of socialising the knowledge is to any degree intrinsically motivating, or can be effected by extrinsic motivators.

2.4.3 Transfer, sharing, exchange of knowledge

As the previous section demonstrated knowledge is created when tacit and explicit knowledge work together, supported by a process of diffusion (Nonaka and Takeuchi, 1995). Knowledge moves between individuals and between organisations either

through the process of transfer, sharing, or of exchange. The following table illustrates the differences between transfer, sharing and exchange of knowledge, as defined in Wang and Noe (2010).

| Knowledge | Emphasis |
|------------------|---|
| Transfer | Involves the sharing of knowledge from source to recipient, and the application of this knowledge by the recipient |
| Sharing | Sharing knowledge for the purpose of helping others. Encourages collaboration to develop new ideas and solve problems |
| Exchange | Two way process of knowledge sharing and knowledge seeking between different individuals |

Table 3 - Comparison of knowledge transfer, sharing and exchange

If we think in terms of university and industry collaborations the emphases are subtly different. The role an academic would play with regards transfer, sharing or exchange of knowledge would differ. Engaged in knowledge transfer the academic effectively becomes an “expert” sharing know-how; engaged in knowledge sharing the academic enters more of a “collaborator” role, working with industry representatives to develop solutions to problems; and, engaged in knowledge exchange the academic is an “equal” to the business representatives as a result of the two-way process. With regards to the research problem KTPs are, by their very title, regarded as instances where the academic acts as the “expert”. It will be interesting to see the degree to which this holds true and the degree to which this role is motivating. It will also be worthwhile analysing whether or not knowledge sharing and exchange takes place and whether KTPs provide opportunities for this to be seen as motivational.

Van de Ven (2007) also makes three important comments about knowledge transfer, which have relevance to KTP activity. Firstly, research findings are more likely to be shared and used if the recipient perceives that the new knowledge will give them an advantage over other competitors (Van de Ven, 2007, p. 241). The knowledge needs to be communicated so it is easily understood and can be applied to the situation., Where the businesses are involved in the development of new knowledge they require for competitive advantage, the process of KTP engagement should ensure that the collaborations result in new knowledge, products, and processes that are innovative and will create change in the organisation so, as products and processes develop,

these will contribute to business growth.

The second issue Van de Ven describes relates to the first point. He explains that knowledge is more likely to be adopted when the stakeholders have been involved in the process of knowledge creation (Van de Ven, 2007, p. 242). KTP requires collaboration between business and university through the support of an Associate. The danger that the business will not want to adopt the new knowledge, or fail to understand the purpose of the new knowledge, consequently should be avoided. The final issue, the presentations of arguments that are rhetorically persuasive (Van de Ven, 2007, p. 242) as such applies less to KTP activity because the purpose of the research is not specifically about persuasion. As highlighted above, the nature of KTP activity involves collaborations, and developing ideas for a specific audience, that is the business involved in the KTP. Van de Ven's third argument might have more relevance when considering the reporting of KTP activity, or the involvement of academics in writing and publishing papers, based on the research, for the REF. Here academics will be keen for their ideas to be shared which, if they are sufficiently persuasive, are more likely to be used by a wider academic audience. As a consequence academic reputations are built upon and maintained.

2.4.4 Open innovation and co-production of knowledge

Another important concept is open-innovation. Open innovation is the “...commercialisation of external (as well as internal) ideas by deploying outside (as well as in-house) pathways to the market” (Chesbrough, 2003, p. 36–7). Chesbrough (2003) argues that the typical practice of companies developing, marketing and selling their own products and services has changed. The diagram below represents the traditional view (closed innovation) versus the newer model of open innovation (Chesbrough, 2003):

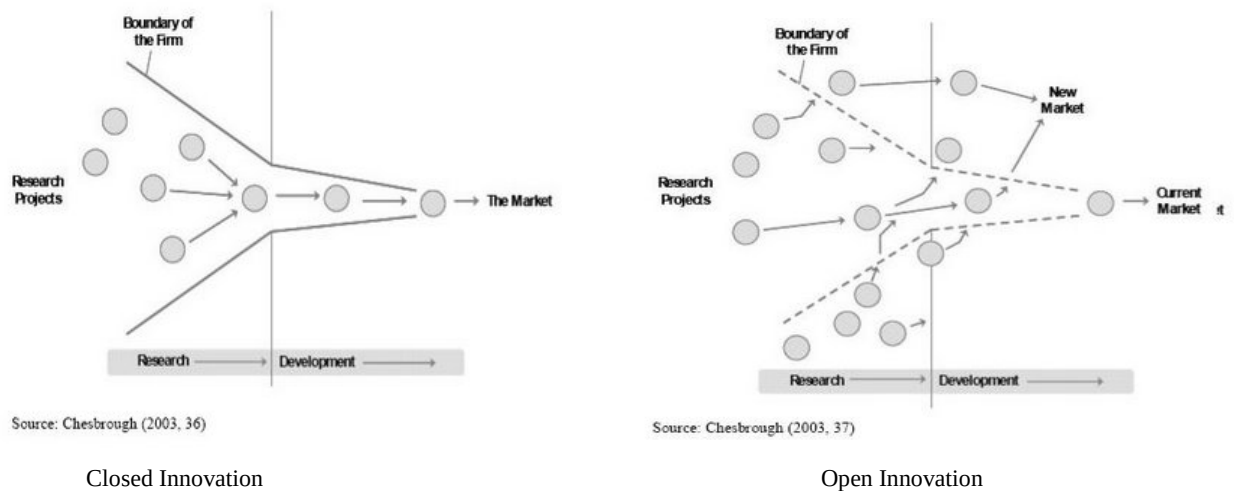


Figure 2 - Chesbrough's (2003) closed and open innovation

The two models represent how knowledge is produced in a firm. Traditionally, in the closed innovation model, research projects were fed into the company, and developed in-house, and the resulting ideas sent to the marketplace to generate income. The open innovation model produces knowledge in a different way, with research ideas originating from in-house, and from external sources. The ideas are developed in-house, but also in external environments, and then are fed into the current marketplace. Indeed new, perhaps untested, markets could be found for the products.

Certain challenges are presented by adopting an open innovation approach and these included finding ways to exploit the new knowledge, finding external partners and assimilating external knowledge into established internal working practices. Another challenge relates to the partnership required for the development of products. As

companies might not always have the in-house expertise to develop a project, they will have to seek new development partners and collaborate in order to bring a product to market. The National Centre for Universities and Business (NCUB) considered best practice strategies for innovation through university-business collaboration and it stipulated that partnerships based on trust were of paramount importance (National Centre for Universities and Business, 2012, p. 12).

For businesses in the UK the KTP programme offers a means by which to address these challenges. The Knowledge Transfer Office (KTO) helps businesses to find external partners in the universities, and then the business lead, academic lead and Associate work together to co-produce new knowledge, both tacit and explicit, and then exploit the new knowledge via developing technologies and processes. With the Associate and academic lead working with business for two years the process of assimilating external knowledge can progress at a rate suitable to the needs of the business.

2.4.5 Summary

The purpose of this section has been to provide an understanding of the concepts of innovation and knowledge, and to show how these relate to KTP activity. Innovation is needed in order to introduce new ideas, products, and services, which contribute to the knowledge in the business. Together these contribute to the growth of the company, and allow a product to be brought to market. An environment which supports innovation, growth, and productivity is also required, and European and national policy makers have sought to provide the suitable conditions for this activity. These policies are explored in the section that follows.

2.5 HIGHER EDUCATION POLICY

European Union (EU) policy focuses on innovation, productivity and growth as a means by which to deliver knowledge transfer, and because EU policy steers the national policies of the Member State's, it is important to understand policy implications and the bearing these might have on KTP activity.

2.5.1 European policy

In recent years there have been six significant statements on innovation, productivity, and growth, which are as follows:

- *Lisbon Strategy for Growth and Jobs* (The European Commission, 2005)
- *Putting knowledge into practice: A broad-based innovation strategy for the EU* (Commission of the European Communities, 2006)
- *7th Framework Programme for Research and Technological Development (2007-2013)* (The European Commission, 2007a)
- *Improving knowledge transfer between research institutions and industry across Europe: embracing open innovation – Implementing the Lisbon agenda* (The European Commission, 2007b)
- *Improving knowledge transfer between research institutions and industry across Europe: embracing open innovation – Implementing the Lisbon agenda – Voluntary guidelines for universities and other research institutions to improve their links with industry across Europe* (The European Commission, 2007c)
- *Europe 2020 Flagship Initiative Innovation Union* (The European Commission, 2011)

The focus of these policies is innovation, productivity, and growth as well as discussion of key ideas relevant to knowledge transfer, Higher Education, and motivation. These are summarised below:

2.5.1.1 Competitive advantage

The focus of much of the policies is on generating competitive advantage. Competitive advantage is defined as the

“...value a firm is able to create for its buyers that exceed the firm's cost of

creating it. Value is what buyers are willing to pay, and superior value stems from offering lower prices than competitors for equivalent benefits or providing unique benefits which more than offset a higher price. There are two types of basic competitive advantage: cost leadership and differentiation”

(Porter, 1998)

Being innovative and transferring knowledge between academia and industry should it hoped make Europe more globally competitive and contribute to growth and productivity. Furthermore having a good education system which supports and nurtures its staff and students is seen as vital. In Europe 2020 (The European Commission, 2011) it was stated that a good, modern education system will attract top global talent and those strategies to address the quality of doctoral training and researcher mobility will help retain innovative individuals.

2.5.1.2 Strategies to encourage innovation

The broad-based innovation strategy of 2006 (Commission of the European Communities, 2006) was designed to put knowledge into action and education was seen as a vital component in this process. It was recognised that education institutions nurtured talent and creativity but also needed strategic partnerships with businesses if they were to have the best opportunity to share knowledge for competitive advantage. Universities having the autonomy to collaborate in partnerships which encouraged the sharing of staff, the development of science parks, and opportunities for entrepreneurial activity would mean cultural barriers, such as different work ethos's and academic-practitioner language barriers, could be reduced. Reducing these barriers between academia and business would lead to a more innovation-friendly European Union.

The EU would support academia and business collaborations through a series of schemes including a European Institute of Technology (EIT), European Technology Platforms, Joint Technology Initiatives, Marie Curie Fellowships, Knowledge Alliances and Knowledge and Innovation Communities (KIC). These projects aimed to unite the three sides of the “knowledge triangle” (education, research and innovation) and introduce new models of governance and finance to support these activities.

2.5.1.3 Collaborations

Collaborations between academia and business were seen as the way by which knowledge would be transferred for the best competitive advantage. The 7th Framework Programme (The European Commission, 2007c), which will be replaced by Horizon 2020, advocated Public Private Partnerships intended to work on technological development and demonstration projects in high priority areas. These projects would be co-financed and industry would lead an element of the project.

In 2007 the EU discussed how to improve knowledge transfer between business and industry and within this document detailed a series of benefits from collaboration:

- mutual trust leading to long-term strategic partnerships;
- development of project management skills and identification of need and demand from industry;
- enhancement of status and prestige;
- obtaining new clients for research projects;
- provision of real world examples to then be transferred to teaching;
- better awareness of the socio-economic value and relevance of research;
- means to attract and motivate academic staff with more entrepreneurial inclinations;

They also advised that universities should employ experienced staff dedicated to managing knowledge transfer. These individuals would have working knowledge of university industry collaboration and be able to break down cultural barriers.

A university which looks active in the field of knowledge transfer, which boasts a series of research projects relevant to industry, and which supports its staff in engaging with industry has the potential to attract both strategic partners, and staff who want to use their knowledge and expertise to find innovative solutions to real world problems. This could give the university, and the wider community, advantages over local, national and international competitors.

2.5.2 UK policy

As Europe has placed increasing emphasis on knowledge exchange and innovation, so has the UK Government. Here, in historical order, are a range of policy documents from UK Government and the Higher Education Funding Council for England. These policy documents are:

- *The Lambert Review on Business-University Collaborations* (HM Treasury, 2003)
- *The Future of Higher Education* (Department for Education and Skills, 2003)
- *The Sainsbury Review of Science and Innovation* (HM Treasury, 2007)
- *Innovation Nation* (Department for Business, Innovation and Skills, 2008)
- *Higher Ambitions: The future of universities in a knowledge economy* (Department of Business, Innovation and Skills, 2009)
- *The Current and Future Role of Technology Innovation Centres in the UK* (Department of Business, Innovation and Skills, 2010)
- *Higher Education Innovation Funding 2011-12 to 2014-15* (HEFCE, 2011)
- *A Review of Business-University Collaboration* (Wilson, 2012)
- *Following up the Wilson Review of business-industry collaboration: Next steps* (Department for Business, Innovation and Skills, 2012b)
- *Best practice strategies for successful innovation through university-business collaboration* (National Centre for Universities and Business, 2012)
- *Encouraging a British Invention Revolution: Sir Andrew Witty's Review of Universities and Growth* (Department for Business, Innovation and Skills, 2013)
- *Growing the brightest and the best – the drivers of research excellence. A report for Department for Business, Innovation and Skills* (Economic Insight, 2014)
- *British Inventions, Global Impact – The Government's response to Sir Andrew Witty's Review of Universities and Growth* (Department for Business, Innovation and Skills, 2014a)
- *Our plan for growth: science and innovation* (Department for Business, Innovation and Skills, 2014b)
- *Government response to the House of Commons Business, Innovation and Skills Report on Business-University Collaboration* (Department for Business, Innovation and Skills, 2015)

The policies, whilst having slightly different foci, discuss a series of key ideas relevant to knowledge transfer, Higher Education and motivation. These are summarised below:

2.5.2.1 Issues of supply and demand

National policies are keen to ensure that there is demand from industry for ideas and innovations developed by researchers. In the Lambert Review (HM Treasury, 2003) the Treasury acknowledged that, whilst there is a ready supply of ideas and innovations, take up from industry was less developed. From the Lambert Review in 2003 to present day policies there is increasing emphasis on making business less passive and more ready to make demands for relevant research, products and processes developed in universities. In doing so it makes research more usable and appropriate to industry.

One way of making research more appropriate is by researchers working closely with industry to co-produce solutions and innovations suitable for market (Chesbrough, 2003). Here partners jointly develop solutions rather than use traditional handover methods. Researcher mobility was emphasised as key to improving this process, enabling researchers to take secondments within companies. It was hoped that this would lead to researchers able to communicate in terms better understood by industry partners.

2.5.2.2 Collaboration

Collaborations were identified as being vital to improving relationships, developing innovative products and for increasing supply and demand.

Policy makers recognise that partnerships need to be stronger if they are to be more effective. In 2009 it was pointed out that there was a need to move away from business and industry being merely passive customers (Department of Business, Innovation and Skills, 2009). This, in some respects, echoed comments made in the Lambert Review which said that there was no issue with the supply of knowledge from universities, but demand from businesses was lacking due to complexities in funding regimes and a lack of accessibility to universities in local areas. Programmes such as KTPs are an attempt to increase collaboration between academia and industry and designed to help

them develop new products and processes. Their importance was recognised in 2007 when the Sainsbury Review (HM Treasury, 2007) recommended that the TSB be given additional funding and the number of KTPs be increased.

There have been attempts at forming formal collaborations between university and industry and these have included Faraday Partnerships. These were aimed at

“...promoting improved interactions between the UK science, engineering and technology base, and industry, through involvement of intermediary organisations”

and sought to,

“...strengthen the way technology is developed and exploited within the UK by stimulating coherence between researchers and new product developers”

(AIRTO, 2001, p. 7)

Technology Innovation Centres (TICs) are a new form of partnership, which have built upon lessons learned from initiatives such as Faraday Partnerships, which Government believe were “unsuccessful” (The Stationery Office, 2011, p. 3). They are designed to bridge the gap between researchers and users working on particular problem domains (examples include UMIC at University of Manchester, or The Technology and Innovation Centre at University of Strathclyde). In 2011 Government stated that the criteria for selection would be technology and innovation research centres where the science is of a high quality, and there is an economic benefit to society (The Stationery Office, 2011, p. 3). The scheme has not been without criticism and plans for the centres have been met with a mixed reception, with some believing that they simply added another level of bureaucracy (Fearn, 2010). The review suggested that the way in which the TICs are funded needed to be reviewed so that additional pressure is not placed on the TSB. There were also concerns that business lacked knowledge about UK capabilities with regards to science, engineering and technology. Both of these concerns are common to innovation initiatives, but Government feels that the “...initial signs are encouraging...and have been broadly

welcomed” (The Stationery Office, 2011, p. 3), particularly by those contributing to their inquiry in 2011.

The newest initiative is University Enterprise Zones (UEZs). When Regional Development Agencies (RDAs) were abolished in 2012 Local Economic Partnerships (LEPs) took their place. LEPs are partnerships between local authorities and business, where each LEP can apply to have an enterprise zone within its boundaries. In doing so they can take advantage of certain tax incentives and simplified planning regulations in order to encourage businesses to start up or expand in their area. Within the LEP a UEZ could also be trailed. £15m was offered to 4 trial zones in Bradford, Liverpool, Bristol and Nottingham. UEZs aim to

“...encourage universities to strengthen their roles as strategic partners in local growth to engage with LEPs, building on existing capabilities and partnerships,

and,

“stimulate development of incubator or ‘grow-on’ space for small businesses in locations that encourage businesses to interact with universities and to innovate” (Department for Business, Innovation and Skills, 2012a)

They are formed from a partnership between a university, LEP and other partners, and have access to support for exporting, but do not receive the same tax incentives as enterprise zones. The UEZ will be evaluated at the end of the trial in 2017.

2.5.3 Funding

Funding is an important issue in national policy. The way in which knowledge transfer activities are supported has changed slightly over the years, with the abolition of Regional Development Agencies in 2012, and the introduction of Local Economic Partnerships and enterprise zones.

2.5.3.1 Higher Education funding

The Higher Education Funding Council, England (HEFCE) allocates specific funds to

knowledge exchange. Over the period 2015-16 £160 million is dedicated to fund knowledge exchange, compared to £1,558 million for research, and £1,418 for teaching activities (HEFCE, 2015). They

“...aim to target knowledge exchange funding where the greatest positive impact on the economy and society can be achieved, based on higher education knowledge and skills” (HEFCE, 2015, p. 10)

and knowledge exchange and innovation is funded from a variety of sources including Research Councils and Innovate UK (formerly the Technology Strategy Board), and local strategic partnerships.

Funding bodies such as HEFCE, Innovate UK, and Research Councils UK (RCUK), are all interested in ensuring that funding has social and economic benefits and impact. RCUK describe impact as “...the demonstrable contribution that excellent research makes to society and the economy” (Research Councils UK, 2011a) and impact is a key driver, for example, for Higher Education Innovation Fund (HEIF) funding in the 2011-12 to 2014-15 period. HEIF funding is given and judged primarily in terms of the economic and social impact achieved. This is in contrast to 2009 when HEIF funding began, and was used to foster culture change and create readiness for knowledge exchange. There is now the expectation that universities have a strategy for knowledge exchange and funding bodies want to see what impact is being achieved. Benefits from research with impact are said to include the fostering of competitiveness, good practice in policy making and improvements to quality of life and society.

2.5.3.2 Research Excellence Framework

Impact is further evidenced through the Research Excellence Framework (REF). Submissions to the REF 2014 (‘Research Excellence Framework’, 2014) assess the quality of research in higher education, and it was brought in to replace the Research Assessment Exercise, which was last conducted in 2008. It is jointly conducted by the higher education funding councils of England, Scotland, Wales, and Northern Ireland, and managed at HEFCE offices. The intention of the REF 2014 is to give accountability to the spending of public funding, and to provide direction for future research spending.

Additionally it provides benchmarks for judging academic reputations, both within higher education and in the public domain.

Universities were asked to submit four-page case studies to illustrate examples of research conducted by academics at their institution. In total, 154 Higher Education Institutions (HEIs) submitted 6,975 case studies. Impact accounted for 20% of the total assessment and was defined as activity which had an effect on society, beyond academia. Initial analysis of the REF case studies has illustrated that UK HEI research has a diverse, interesting, and considerable impact on society; much of research is multi-disciplinary and the societal impacts are “multi-impactful” (King’s College, London and Digital Science, 2015, p. 71)

2.5.3.3 Funding knowledge exchange

The focus on funding research-intensive universities shifted in 2003 to interest in funding post-1992 universities who were seen to be locally engaged and collaborating with small as well as large companies. This was followed in 2005 by the Higher Education Innovation Fund (HEIF) which was strengthened in order to encourage non-research intensive universities to engage with employers locally, regionally and nationally. This change in focus is important for this research study. It provides some historical context to explain how less research-intensive universities were encouraged to develop collaborative activity, and why there might have been an increased take-up of engagement activity such as KTPs at less research-intensive universities.

KTPs were launched in 2003 to replace Teaching Company Schemes (TCS), which the Department of Trade and Industry and Department of Education and Science began in 1975, as a means to address perceived shortages of top engineers in industry. KTPs are managed by the Innovate UK, formerly Technology Strategy Board (TSB), which is the UK's national innovation agency and seeks “...to accelerate economic growth by stimulating and supporting business-led innovation” (Technology Strategy Board, 2012). They work to join-up research with business and the government and seek to reduce barriers to innovation through their support programmes. The TSB also works in partnership with Research Councils UK (RCUK), the body which manages and distributes research grants to universities via its network

of Research Councils. The recent RCUK Impact Report 2011 demonstrated the effectiveness and strength of the relationship, the maintenance of which both the TSB and RCUK are committed. The partnership was effective in generating economic benefit and the strengths were seen to be from the RCUK taking advantage of the TSB's industry led expertise and the TSB capitalising on RCUK's access to funding and support for excellence in knowledge transfer and research (Research Councils UK, 2011b, p. 4)

With regards to knowledge exchange and transfer RCUK pointed out that it is not always easy to quickly achieve impact because of the complexities of capturing and measuring impact and because some activities require time to become embedded into processes, for example. Relevant to this study of individual academic motivation in the context of knowledge transfer activity is the Knowledge Exchange Principle which states that researchers should be "...incentivised through recognition and reward by their host Research Organisation and the research community" (Research Councils UK, 2011b). As in the European policies related to knowledge transfer, there is evidence that incentives are seen to be an important part of the individual researcher's involvement in knowledge transfer activity. This research study is interested in seeing what effect recognition and rewards have on intrinsic motivation and how they can act as extrinsic motivators. To have incentives recognised as relevant is an assurance that this exploration is worth consideration.

2.6 KNOWLEDGE TRANSFER PARTNERSHIPS

The previous section considered European and National policy with regards to knowledge transfer and recognised the importance of policies and funding organisations which are supportive of university-industry engagement and collaboration. This next section focuses on a specific mechanism for knowledge transfer, namely KTPs. This is a national example of collaboration between academia and industry and also the context in which individual academic motivation for knowledge transfer to industry will be considered in this study.

2.6.1 Background

KTP is a UK wide programme, funded by 12 public sector organisations and led by

Innovate UK, and is designed to act as a mechanism to transfer knowledge between universities and businesses. According to data from Innovate UK, between 2013 and 2014 350 departments, in 98 HEIs, had KTP projects (Innovate UK, 2014, p. 5).

According to data from 2013-14 the service industry was the dominant industrial sector engaged in KTPs, with instrument and electrical manufacturing following closely behind. The primary business functions for the KTP was research and development, followed by product development and design (Innovate UK, 2014, pp. 13–14).

2.6.2 Aim

The aim of a Partnership is to gain and share knowledge in order to develop a product or process. This knowledge and the associated skills needed and gained from involvement in the Partnership, is then used for the strategic development of the business, with the ultimate aim being to gain advantage over competitors. The KTP is comprised of an academic, based at the knowledge base, a business, and an Associate.

In order to maintain the interest of all parties it is expected that the KTP

- Be of shorter-term enabling or longer-term strategic importance to the business
- Require expertise from the knowledge base partner
- Be a challenge for the Associate

(Innovate UK, 2015a)

2.6.3 Process

A KTP usually originates in one of two ways – either from an established relationship an academic (or the Department) has with a business, or from a University Knowledge Transfer Office (KTO) either marketing KTPs to local businesses or local businesses approaching the KTO with a research problem appropriate for a KTP. The first part of the process is to write a project proposal. Proposals are written as collaboration between the academic and business lead, with support from the KTO. It is then up to the knowledge-based partner to submit the proposal to Innovate UK.

Once the project is approved an Associate is recruited. An Associate, who can be either a graduate, post graduate, or post-doctoral, will be employed by the University but will normally be based at the office of the business organisation. KTP funds the Associate, and part funds the partnership project, with the rest funded by the business, which costs them around £20,000 per year. KTP can last between 6 months and 3 years, and the academic and business lead will mentor the Associate over this period. In many cases successful completion of the KTP will lead to employment for the Associate. It is also expected that the academic spends the equivalent of at least half a day a week with the business and Associate.

2.6.4 Criteria

Each KTP is governed by a set of overarching criteria (Arts & Humanities Research Council, 2011), some of which are particularly relevant to motivation and the research context:

- it must provide the Associate with a suitable intellectual challenge;
- there must be a clear need for the knowledge / skills / technology to be transferred;
- the University will provide appropriate knowledge / skills / technology;
- the Company must be able to make use of the knowledge / skills / technology transferred;
- there must be clear benefits to the university, including target outcomes.

The diagram below represents how these criteria are enacted by illustrating the relationship between, and the roles of, the project participants:

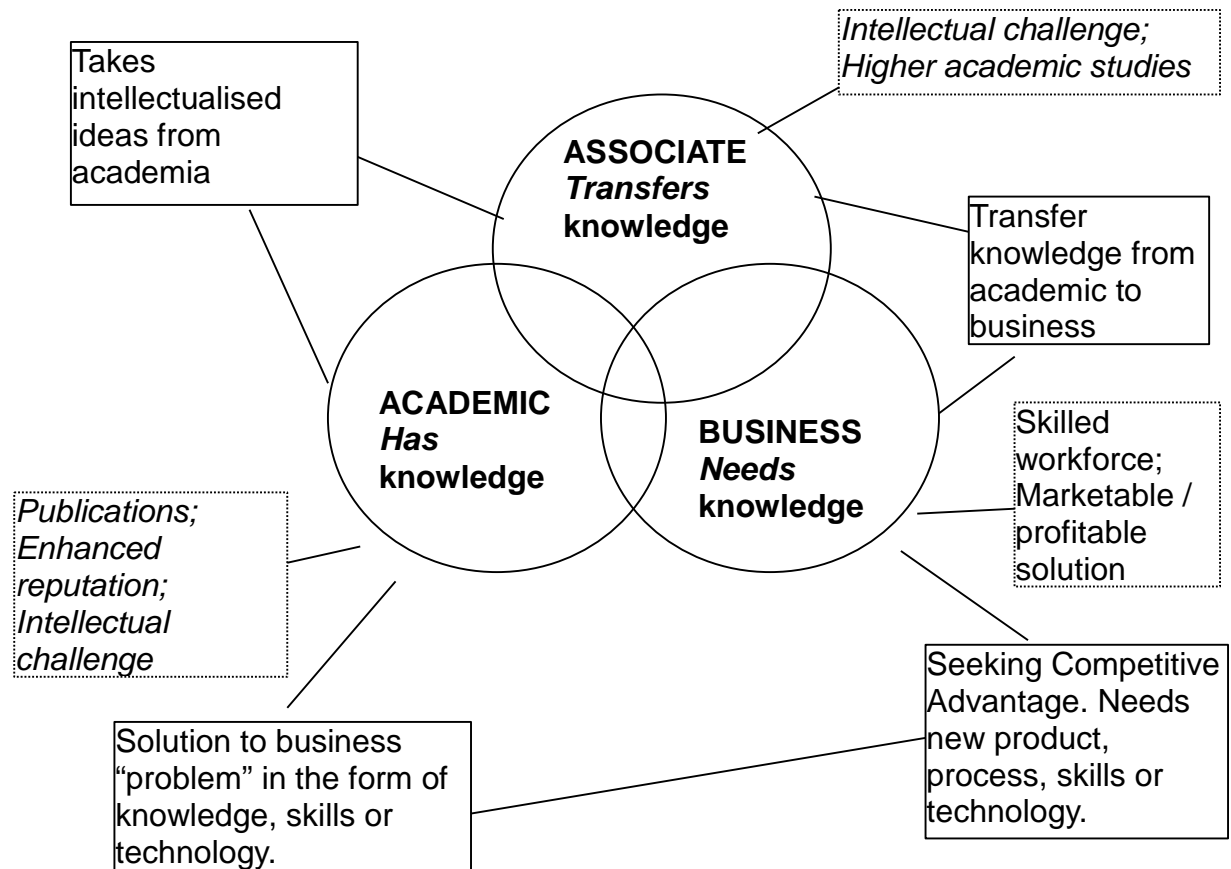


Figure 3 - Knowledge Transfer Partnership: role and relationships (adapted from Technology Strategy Board, 2010, p. 6)

The Associate acts as a conduit for knowledge. The business is seeking a solution to a practical problem but cannot, on their own, enable changes needed for competitive advantage. The University provides a solution but this solution is developed over the period of the project and not immediately available. For the individual academic there are both academic and project outputs.

2.6.5 Benefits and outputs

Over the period 2001/2 to 2007/8 KTPs secured around £4.2-£4.6 billion new sales, £1.6-1.8 billion GVA and 5,530 – 6,090 new jobs (Regeneris Consulting, 2010, p. iii). As well as these more obvious economic benefits there is also a wider benefit including increased capacity for innovation, relationships from networking and feedback into

academic teaching and identification of new research themes.

2.6.6 Benefits for the knowledge base and the academy

According to the 2013-14 KTP Achievements and outcomes report, 98% of knowledge bases reported that the KTP contributed to staff development. 92% reported benefits to teaching, and 91% reported benefits to research. Additional benefits for the knowledge base included, on average, three new research projects, two research papers in referred journals, and three other articles published elsewhere regarding KTPs (Innovate UK, 2014, p. 15).

The benefits to academics include contribution to REF, potential future collaborations, application of knowledge and expertise, and identification of new avenues for research and teaching. Also of benefit is the experience of supervision and mentoring of the Associate, and the gain of an improved understanding of how businesses operate and the challenges they face (Innovate UK, 2015b).

2.6.7 Benefits for the business

90% of participating businesses reported increased profitability, due to increased sales, but also improved operations and quality. A project generally resulted in at least three members of staff being recruited, often including the Associate, and other staff members received additional training. Exports increased as did investment in research and development (Innovate UK, 2014, p. 11)

2.6.8 Benefits for the Associate

KTP engagement provides an opportunity for a graduate to launch their career, and gain knowledge of how businesses operate, whilst also benefiting from the opportunity to work towards a higher degree. As a consequence of involvement in a KTP, Associates generally found that they were more employable as a result of this experience, and the management training provided. Between 2013-14 around 58% of Associates found themselves being recruited by the business partner. Innovate UK note that this is a drop from the 70% average for previous years, and they state that they will be concerned if this becomes a downward trend (Innovate UK, 2014, p. 17)

2.6.9 The relationship between Knowledge Transfer Partnerships & motivation

As the aim of the research study is to evaluate how academics experience motivation in the context of KTPs it is worth reflecting on a study commissioned by the TSB (now Innovate UK) in 2010 which reviewed the Knowledge Transfer Partnership programme. The key findings included

- KTP is a well liked product with good satisfaction levels;
- KTP has a well established delivery model, and it is delivered in a supportive policy environment;
- KTP is an intensive commitment and requires all members of the partnership to be equally committed to the relationship;
- Expectations are generally met and failure rates are low, and the work of the Associate is generally appreciated;
- The speed and efficiency of the programme cause frustrations and can be detrimental to the image of KTP;
- Promotion of KTP is not always clear and they can seem isolated from other knowledge transfer mechanisms

(Regeneris Consulting, 2010)

These findings relate to the specific programme but could affect individual motivation if these concerns have an affect on the KTP environment. If, for example, not all parties involved are fully committed then one or more individuals may feel they have to carry the burden of the project and have to work additional hours to ensure the project is a success. Similarly, if the start of the project or the employment of the Associate is delayed, then interest in, and commitment to, the project could begin to wane, leaving those involved frustrated and de-motivated.

Academics were asked about the reasons why they wished to participate in the exercise and these included the fact that they were motivated by the opportunities provided for teaching, for fulfilling their University's mission, and the opportunities to see how research impacts on the real world, more than by opportunities for research publications. This was of concern to the TSB and they recommended that academic

incentives be improved and research from KTPs be more appropriately recognised in the Research Excellence Framework (REF) (Regeneris Consulting, 2010, p. 8).

The findings from the Regeneris report suggests that KTPs represent an intellectual challenge for academics, as they are finding opportunities to see how their research impacts on the real world. In motivation terms this could be intrinsically motivating if it is something the academics enjoy, and incorporates into what they like doing and accept as part of their role. There also seems to be a strong feeling of responsibility. Academics surveyed were motivated by the contribution their involvement made to teaching and fulfilling their University's mission. This represents an extrinsically rewarding activity, which engaged in of their own volition, could be extrinsically motivating, leaving them with feelings of self-worth and fulfilment.

2.6.10 Summary

The aim of this section has been to understand better KTPs by providing some background and exploring the criteria by which potential projects are evaluated. The section concluded with reference to a report commissioned by the TSB in 2010 (Regeneris Consulting, 2010) which evaluated the KTP programme and in doing so referred to motivation. This 2010 study is relevant to this research study because it confirms that individual academic motivation is a relevant and important area of study. The data is also useful because it provides a baseline by which to compare data from the interviews conducted in this research study, and its recency is helpful because it is illustrative of current conditions in the KTP context.

2.7. BEST PRACTICE FOR THE TRANSFER OF KNOWLEDGE

In the NCUB report (National Centre for Universities and Business, 2012) they provided good practice guidelines for the transfer of knowledge between universities and business, and referred to KTP as an example of bringing together all the best attributes of knowledge transfer. This will be discussed once the means for effective knowledge transfer have been discussed.

2.7.1 Effective knowledge transfer

The NCUB model for effective knowledge transfer is based on extensive research,

including over 200 case studies of effective collaborations. From this research they have developed a 5 stage process for knowledge transfer, as shown in Table 4.

Company Opportunity (C1): a business recognises that there is an opportunity or a problem that it could address if it had access to knowledge and expertise in specific areas. This recognition needs to be combined with an awareness that a university or HEI might be the place from which to acquire such knowledge. Furthermore, the potential for a successful project depends on finding the right institution and the right partner within it.

Co-Recognition (C2): Seeds of the partnership begin with a potential match between business needs, appropriate research and willing researchers within an institution. An agreement formalises issues such as intellectual property and delivery conditions. This agreement process will also involve the Technology Transfer Office of the university (TTO) and legal representatives on both sides.

Co-Formulation (C3): The researchers' generic knowledge is adapted or 'localised' to meet the specific needs and opportunities of the business partner's processes, products and markets. Knowledge from the academic and business domains is synthesised. This requires collaborative working and the building of trust amongst the partners.

Co-Creation (C4): As the project develops, the partners create the opportunity for innovation in process, product or markets. This depends on the firm's absorptive capacity and also on its ability to deliver.

Commercialisation (C5): For business, successful commercialisation is the end goal. Success in the market place and adoption by end users is the mark of successful innovation.

Table 4 - 5 stages for processing new knowledge for innovation (National Centre for Universities and Business, 2012, p. 7)

For businesses to be continuously innovative they need to have an “absorptive

capacity” (Cohen and Levinthal, 1990 cited in National Centre for Universities and Business, 2012, p. 5). At the outset the company needs to be willing to develop a new product, and look for new ways of working, and with people beyond their traditional remit. They have to open to external knowledge, meaning they need to have a potential absorptive capacity, as well as a realised absorptive capacity, and then be able to exploit the knowledge once they absorb it (Zahra and George, 2002 cited in National Centre for Universities and Business, 2012, p. 5).

The NCUB also highlight the potential barriers to innovation, which include access to finances, and weaknesses in the ability to network and co-operate with partners. These issues might need addressing through policy as well as through effective knowledge transfer processes. Whilst these issues are specific to businesses, there are also barriers to knowledge transfer related to academics and HEIs. Academics, for example, often work in silos and difficulties arise when problems need solutions from a variety of sources. Expectations can also be different, with academics seeking repeatable results but businesses needing one-off solutions (Docherty et al, 2010 cited in National Centre for Universities and Business, 2012, p. 10).

2.7.2 Effective knowledge transfer and Knowledge Transfer Partnerships

Figure 4 illustrates how the 5 stages for processing new knowledge for innovation are enacted through KTPs.

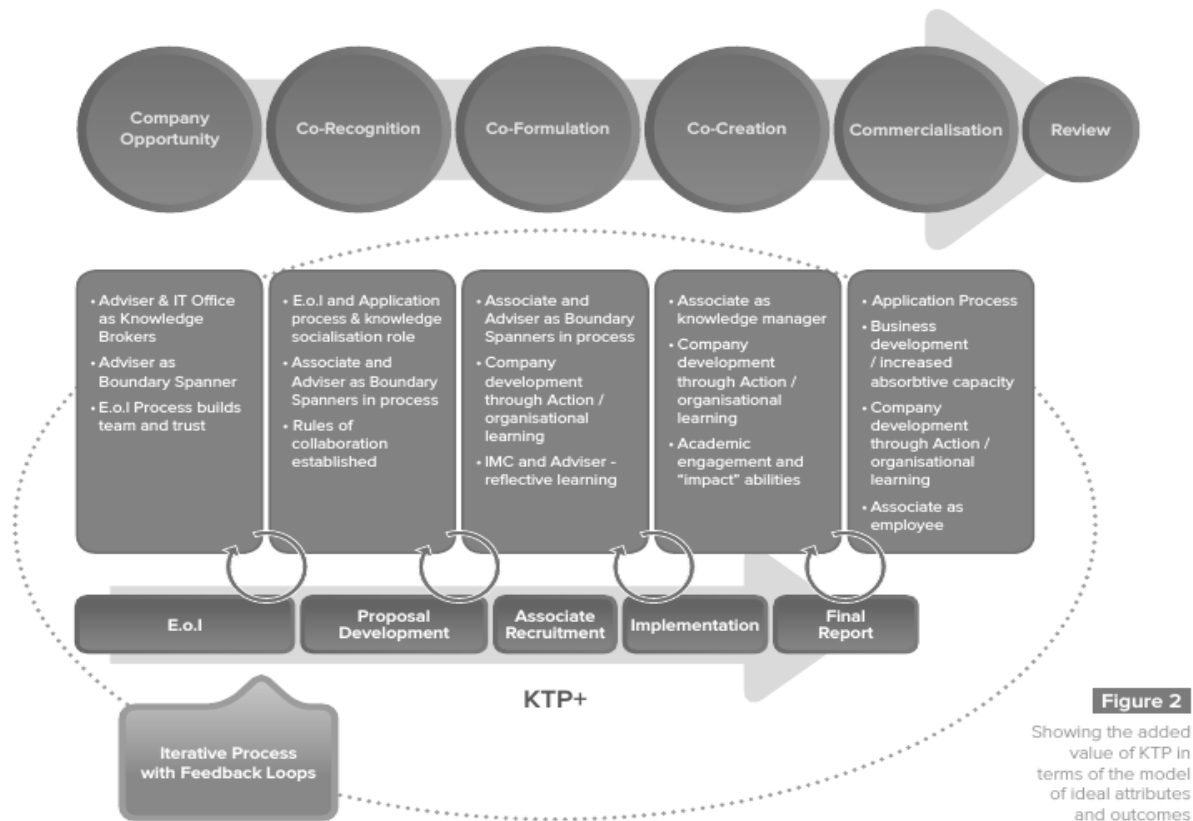


Figure 4 - 5 stages for processing new knowledge for innovation enacted through Knowledge Transfer Partnership (National Centre for Universities and Business, 2012, p. 17)

NCUB regard KTPs as a holistic approach to knowledge transfer, with lasting and transformative powers. Innovation takes place at every stage of the process, from the company being in a position to identify that they need external help to resolve an issue, to the collaborative working to formulate a project proposal and recruit a suitable Associate, to the implementation of the product and its commercialisation. It is a holistic process because of the iterative nature of the process, and the continuous feedback loops, which encourage reflection and organisational learning. This gives an added value to knowledge transfer, as does the mentoring of the Associate, and the way in which the Associate acts as a boundary-spanner between HEI and company.

2.7.3 Summary

This section has considered best practice for the transfer of knowledge, using guidelines from the report by NCUB which considers how best to encourage innovation through university-business collaborations. They provide a 5 stage process, which starts with the business recognising they have an issue which needs resolving with the help of people external to the company, and ends with the development and commercialisation of a product, due to collaborations with a knowledge base. Trust is an important part of this partnership, but expectations can be different, and these need to be addressed by effective collaboration, supported by a KTO. A supportive environment is important for continued motivation, and opportunities for constant reflection and learning, give all parties additional knowledge. KTP represents a value-added version of collaboration, and because of the opportunities to develop products, gain knowledge, and form new partnerships, should be motivational for the individual academic the company and the Associate.

2.8 CONCLUSION

KTPs are a national scheme, managed by Innovate UK, designed to support the competitiveness of businesses by providing, and supporting them to access, readily available expertise in UK HEIs. The purpose of the study is to explore the nature of KTP projects, and how these relationships have an effect on individual academic motivation, by understanding the intrinsic and extrinsic motivations derived from engagement in the activity.

The purpose of this chapter was to provide an understanding of KTPs, but also to reflect on knowledge, innovation, and knowledge transfer as concepts. There is a need to understand these because they have the potential to have an impact on motivation. A supportive environment provides the opportunity for businesses to engage in 'open innovation,' which encourages new thinking and supports new partnerships, and should provide the opportunity for those involved to gain new knowledge, both tacit and explicit, about ways of working, product development and processes. This could have a positive effect on motivation, as could successful relationships which are said

to rely on commitment, compatibility, and the co-creation of knowledge.

3 – Literature Review – Motivation

3.1 INTRODUCTION

In the previous chapter the importance of innovation and knowledge transfer, as drivers for productivity, competitiveness, and business growth, was highlighted. Motivation was another, 'softer' aspect, that was under consideration. The purpose of this study is to understand intrinsic and extrinsic motivation and the barriers to motivation, particularly in relation to KTP activity. It is important to consider this because without academics who are motivated knowledge would not be transferred and innovation would not occur. Whilst policy makers are keen to ensure that academics engaging in university-industry collaborations are enthusiastic and involved, and suitably rewarded for engagement, it is also important to consider how the individual interacts with their environment, and what they find personally rewarding.

The Collins English Dictionary defines motivation as “...the process that arouses, sustains and regulates human and animal behaviour”(Collins English Dictionary, 1995). Other definitions include “...the degree to which an individual wants and chooses to engage in certain specified behaviours” (Mitchell, 1982); the “...conditions which influence the arousal, direction, and maintenance of behaviours...”(McCormick & Illgen, 1985); and, “...the inner force that drives individuals to accomplish personal and organisational goals” (Lindner, 1998).

The purpose of this chapter is to:

- understand traditional definitions of intrinsic and extrinsic motivation;
- explore the researcher’s writing process and decision making;
- explain Self Determination Theory (SDT), which is the theory of motivation applied to this study;
- explore alternative theories of motivations, not selected for this research study; and,
- investigate prior studies of university-industry collaboration where motivation of individual academics was the focus of the study

Motivation is therefore concerned with individual human behaviour and with both internal and external drivers. This chapter seeks to outline the relevant theoretical issues related to motivation, and individual involvement in KTP activity.

3.2 INTRINSIC AND EXTRINSIC MOTIVATION

It is common to hear motivation described as being intrinsic or extrinsic to the individual. In the context of KTP activity this study seeks to identify intrinsic and extrinsic motivators for individual academics, in order to develop appropriate guidelines for universities managing and administering KTP projects. Traditional definitions, representative of the intrinsic – extrinsic dichotomy, are considered first. Attention is then turned to Self Determination Theory (SDT), which has evolved from the intrinsic – extrinsic dichotomy, and has altered and developed understanding of intrinsic motivation, as well as behaviour driven by motivators external to the individual. The aim is then to consider its application to the research study.

3.2.1 Traditional definitions

Intrinsically motivated activity has no external rewards. Rather the reward comes from how the activity makes a person feel and the value comes just from engaging in the activity without the need for encouragement or goading. Intrinsic motivation is variously described in terms of the task being interesting, or in terms of the satisfaction a person gains from engagement in an activity. Behaviourist theory, dominant between the 1940s and 1960s, still influences Psychology today, and influences how psychologists describe intrinsic motivation. Believing that behaviour is motivated by rewards, Skinner (1953) proposed that rewards come from doing the activity (so they are internal to the activity). Hull (1943), in contrast, asserted that the meeting of basic needs is intrinsically motivated and that behaviour is motivated by the need to meet these physiological drives. It was only in 1959 that intrinsic motivation was described as such. When studying their behaviour, the behavioural psychologist White (White, 1959), recognised that animals were engaging in playful, curiosity driven activity that required no external stimulus. The motivation for engaging in the activity was therefore internally driven. It was inherently interesting whilst being both fun and challenging.

The second part, of the traditional dictionary definition refers to motivation as “a reason or reasons for acting or behaving in a particular way” (Collins English Dictionary, 1995).

This kind of behaviour is motivated by either a desire to obtain an external reward, or there is a requirement for an external stimulus in order to get a person to act in a particular way. This behaviour has been called the “pale, impoverished” (de Charms, 1968 in Deci & Ryan, 2000, p. 56) cousin to intrinsic motivation, and has been characterised as being non-autonomous (beginning with deCharms, 1968) because of its reliance on an external stimulus. It was also regarded as having a negative, undermining, effect on intrinsic motivation.

3.3 THE PRACTICALITIES OF RESEARCH

When starting this Doctoral study the researcher anticipated that her research and subsequent theory development would be a linear process, with a clear beginning and end point. Instead the researcher experienced a degree of anxiety when she began the process of selecting an appropriate theoretical lens, and this anxiety continued into write-up of the Doctoral thesis. As will be discussed in subsequent sections it started with the approach of adopting all theories of motivation and tried to develop a synthesised definition. Over a period of time this was seen to be impractical in terms of analysis and it was decided to choose SDT, a single theory of motivation as the appropriate theoretical lens.

There are two connected issues which must be discussed prior to engaging in a discussion about the reasons for selecting SDT as the motivation theory used in the study. These two issues are concerned with meaning making or, in other words, advancing the discipline (Kamler & Thomson, in Barnacle & Dall’Alba, 2014, p. 1146) and sought to demonstrate how the researcher would negotiated her role in this process. The issues to be discussed are as follows:

- The anxiety experienced by the researcher when the search for a preferred theory of motivation was not as linear as expected;
- The process by which SDT was chosen as the preferred theory of motivation

3.3.1 Researcher anxiety and the quest for control

When individuals are anxious a lack control is experienced combined with a worry that the choices made are incorrect. Motivation can also be hindered, and can have an impact on how an individual approaches a situation. It is appropriate at this point to

state that during the Doctoral study the researcher experienced challenging personal events which had an impact on how she approached her studies. Lindsay (2015) study of doctoral study and thesis completion alluded to similar results which both surprised and comforted the researcher. Feeling doubtful, uncertain, overwhelmed, apathetic or tired all affected researcher motivation (Lindsay, 2015, p. 192) and at times the researcher felt overwhelmed trying to balance personal commitments with study, and struggled to engage with her studies. Support from her Supervisor and Research Centre were vitally important to the completion of the Doctorate, as were improvements in personal circumstances.

3.3.2 Novice-as-expert

It is safe to say the researcher was troubled by the “‘novice-as-expert’” stance (Cotterall, 2011, p. 414) that researchers are expected to adopt. She did not doubt her ability as a researcher but felt that because she was not a Psychology graduate it would be difficult for her to negotiate her role as an active meaning maker, because as a ‘novice’ her knowledge would not advance the discipline. Being an active meaning maker means having tacit knowledge about the discipline being studied. The researcher felt, initially, that she was at a disadvantage by not being familiar with the characteristics of discourse within the discipline, and debates and assumptions about knowledge (Cotterall, 2011, p. 414) which left her anxious. Over time she was able to come to a greater acceptance that her insights and approach could actually bring a fresh perspective to the field of motivation. Realising that SDT had not been applied to the study of individual academic motivation in KTP contexts gave her greater confidence in the originality of her research, but she was still faced by the challenge of doctoral writing.

3.3.3 The challenge of doctoral writing

Doctoral writing, as Kamler and Thomson (2006) suggest, has three different dimensions including text work which relates to writing conventions, meaning making which relates to advancing the discipline and identity work which looks at how the researcher positions themselves in order to be authoritative; together these enable a researcher to take on the role of a scholar (Kamler & Thomson, 2006 in Barnacle & Dall’Alba, 2014, p. 1146). This ‘double struggle’ of meaning making and learning to engage in research writing means that “...anxiety is inevitable” because Doctoral

writing is “increasingly governed by a quest for mastery as control” (Barnacle & Dall’Alba, 2014, p. 1139). Cotterall (2011) agrees and suggests that writing can be a challenging “...high stakes activity” and source of considerable anxiety because it is not just a “...mopping up exercise at the end but a means by which scholarly claims are tested” (Cotterall, 2011, pp. 413–414).

3.3.4 Researcher as active meaning maker

For new researchers, doctoral writing therefore has a dual challenge – learning to write in a scholarly fashion and developing knowledge in order to advance the discipline. One way in which new researchers can develop knowledge is to find a new perspective or interpreting an existing perspective in a way that has not been tried before. As Krauss (2005) suggests meaning and meaning making have implications for learning and perspective transformation because new learning informs or challenges existing conceptions of meaning (Krauss, 2005, p. 763). Culture, norms, understandings, social reality and definitions of situations, typifications, ideology, beliefs, worldview, perspective or stereotypes are all examples of what makes up an individual’s interpretation of reality (Lofland & Lofland, 1996 in Krauss, 2005, p. 762). In addition researchers look to define their understandings of a particular subject, or reality, by using language to describe their thoughts, actions and interpretations.

The researcher, is not, as has been said before, a psychology graduate and had no previous experience of using or applying motivation theory in either a studying or work context. She has a strong interest in people and society, and how both personal and work relationships are formed and maintained. As such understanding why an individual acted as they did in a KTP context seemed a natural research subject. There also seemed to be a gap in existing research and any research using motivation theory and KTP engagement would provide new meanings and interpretations of reality. This therefore gave the researcher a degree of control over her subject matter and over time as she developed her own rigorous approach to interpreting the data provided by participants she developed confidence in writing about her subject.

3.4 CHOOSING SDT AS THE PREFERRED THEORY

Research for the thesis began in 2008. Initially, under guidance from her Supervisors, the researcher paid some attention to schemes which evaluate engagement activity,

including UPBEAT (University of Salford) and Points of Distinction (Michigan State University) (Fitzgerald, Burack, Seifer, & Votruba, 2010). During the early stages of research she was given the opportunity to participate in a 10 day study tour of universities in the United States who were strong advocates of “outreach.” Outreach is a term used to describe university-driven activity which extends knowledge in order to serve society. During this visit, she saw examples of outreach and discussed mechanisms for assessing outreach activity, but felt that the question of why academics engaged in outreach activity went unanswered. It was then that the researcher decided to explore motivation in more detail. It was decided that it was impractical to compare and contrast examples from universities in United States and Australia. Focus therefore turned to UK based activity, and specifically KTPs. One Doctoral Supervisors was engaged in a KTP so his experience provided the researcher with an initial focal point.

3.4.1 Justifying the selection of SDT

There was a three stages process leading to the selection and adoption of SDT to explore individual motivation to engage in KTP activity. This is demonstrated in Figure 5 and discussed in the following paragraphs:

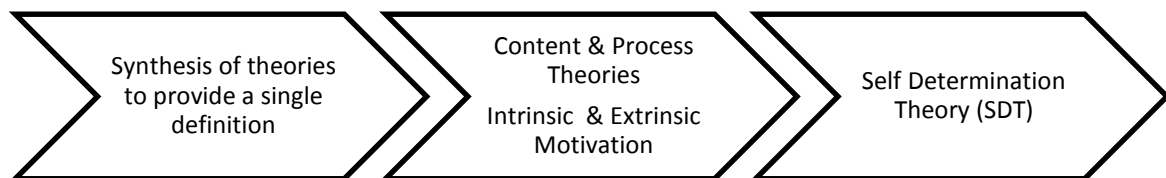


Figure 5 - Process leading to selection of SDT

3.4.1.1 Stage 1 – Synthesis of theories

Having no prior knowledge of motivation theory or experience of applying motivation theory, the researcher’s approach was to gain an overall understanding of motivation. One of the first tasks was to determine a definition. For her, this was a way of becoming an active meaning maker, gaining the knowledge and understanding she felt was lacking. She adapted Hollyforde and Whiddett (2002) overview in order to provide a structure for highlighting the main concepts of each theory and how these could be relevant to studying individual academic engagement. The researcher also used the different themes that occurred to begin development of the interview question used in

the Pilot and Main studies. A snapshot is provided in Table 5 below and shows how the Researcher identified the main concepts and potential research areas to be explored in interview questions.

| THEORY OF MOTIVATION | THEORISTS | MAIN CONCEPT(S) | POTENTIAL RESEARCH AREA(S) |
|-----------------------------|----------------------------------|---|---|
| Achievement Theory | D.C. McClelland J.W. Atkinson | Behaviour is based on the need for achievement (nArch_measurement of need for achievement). This is the capacity to experience pride in accomplishment. <i>Related –</i> Need for power (nPow), socialised power (sPow) or personalised power (pPow) and the need for affiliation (nAff) | To understand how an individual academic defines their success |
| Cognitive Evaluation Theory | E.L. Deci | Activity that is intrinsically motivating becomes extrinsically motivating the more other people link it to external rewards Locus of causality / control can be internal (behaviour self-directed) or external (behaviour affected by environment). Person interprets causes depending on locus | To understand how rewards might affect participation in academic engagement |
| Drive Theory | C.L. Hull | Seeks to explain why people are driven (motivated) to satisfy | To understand why the academic feels they need to |

| | | | |
|--|--|---|---|
| | | <p>certain needs.</p> <p>Drives are result of person working to achieve balance/ satisfaction</p> <p>Drives can be primary (innate) or secondary (eg. Relationships, status, etc)</p> | engage in KTP activity, how their needs change over time, and how their needs are satisfied |
|--|--|---|---|

Table 5 - Theories of motivation (adapted from Hollyforde & Whiddett, 2002) with editions by McCleary (nee Jackson) (2010)

The other objective of the activity was to synthesise all theories of motivation into a single definition applicable to the context area. Thierry and Koopman-Iwema (1984) argued that a unified theory of motivation does not exist because there are a "...large number of 'partial theories' which differ from one another in various aspects" (Thierry & Koopman-Iwema in Hollyforde & Whiddett, 2002, p. 5) but the researcher thought that singular theoretical views did not provide a complete picture of an individual's motivation because they focus on issues such as goal setting, control, attributions for example, rather than encompassing issues like effect of the context on motivation, that were to the study. The researcher had yet to discover SDT which went some way to counteract her personal criticisms about the use of singular theories, and alleviate her anxiety about providing an original approach to studying individual academic motivation in KTP contexts.

3.4.1.2 Stage 2- Content & process theories of motivation

By the stage of the Internal Evaluation the researcher had developed her own definition of motivation,

"behaviour which an individual consciously or subconsciously engages in, and chooses to maintain, in order to achieve personal, social, and organisational goals"

which accommodated the fact that she believed motivation to be a multi-faceted concept, and in the case of KTP activity, was operating in an environment where the

personal, social and organisational were particularly pertinent to the study. She had tested the definition against interview data in the pilot study, and used themes relevant to the definition including identification of personal, social, and organisational goals, but it was clear that the definition alone did not cover the strength of the motivational drive. When, for example, an individual response suggested that one event / experience was “very” motivational on a “personal” level there was no structure to compare degree by which an individual thought an event / experience was “very” motivational. Also there was no clear structure for analysing if the event / experience were motivating for them because they found it interesting, or because they received a form of external reward as a consequence of the activity in which they engaged. Whilst a single definition accommodated the Researcher’s desire for a unified theory, it also resulted in a number of unresolved issues.

Further research suggested that motivation theory could be catalogued according to a focus on individual needs and a focus on individual differences. Individual need theories, or content theories, assume that every individual has the same set of basic needs which they are driven to meet if they are to survive. Example theories include Hierarchy of Needs Theory (Maslow, 1943) and Need for Achievement Theory (McClelland, Atkinson, Clark, & Lowell, 1976). Process theories concern individual differences, and the assumption is made that individuals will react differently to the same stimulus because no individual is the same. Example process theories include Equity Theory (Adams, 1963) and Goal Setting Theory (Latham & Locke, 1979). Whilst this approach gave the Researcher the structure she craved, still it did not answer questions about the intensity of the drivers for motivation.

The Researcher had worried that concentrating on intrinsic and extrinsic motivation was too simplistic an approach for research worth a Doctorate and, consequently had not concentrated on this separation being a means for advancing the discipline. She had to accept that a less complicated approach to understanding motivational theory might be the way for her to be able to ‘infuse’ her writing with a sense of personal identity (Cotterall, 2011, p. 414), because from it she would be able to develop a rigorous approach to data analysis.

With regards being an active meaning maker, the Researcher sought to advance the discipline by identifying what she thought was a gap in theoretical assumptions that

had been made about motivation theory. Being unsure of the discipline made it difficult for the researcher to select what she thought would be an appropriate theoretical lens. Consequently she sought to unify a set of disparate theories because this offered a means by which to advance the discipline. What the research did indicate was that the Researcher needed was a way in which to structure the degree of motivational intention, as well as the degree of personal interest and reward. She had begun to explore intrinsic and extrinsic motivation in more detail than previously. This had been rejected as being “too obvious” by the Researcher as it seemed too simplistic a way of investigating motivation. SDT and the Motivation Continuum (Gagné & Deci, 2005) were then explored to see whether this structure could be adopted for analysing interview data.

3.4.1.3 Stage 3 – Self Determination Theory

SDT not only provided the Motivation Continuum (Gagné & Deci, 2005) which offered a structure by which to understand the strength of motivation, but also the fact that it recognised that the socio-psychological environment was important to understanding motivation made the Researcher more confident that she had found a theory of motivation which could be applied to the context of individual academic engagement and KTPs. Further analysis of SDT will be provided in the sections below and will detail the key points of the theory.

3.5 SELF DETERMINATION THEORY

Self Determination Theory (SDT) emanates from the field of social psychology. Richard M. Ryan and Edward L. Deci, from the University of Rochester in the United States, developed Self Determination Theory as a reaction to behaviourist approaches to motivation, and this still influences psychology today. It is described as a

“meta-theory for framing motivational studies, a formal theory that defines intrinsic and varied extrinsic sources of motivation”

(Self Determination Theory, n.d.)

The focus is on cognitive and social development, and an understanding of how intrinsic motivations and externally driven goals are represented in the psychology of different individuals. Understanding the role of society and culture on motivation, and

if this supports or thwarts an individual's sense of compulsion to act, is also central to understandings of motivation. The best kind of motivation, it is said, comes from the sense of autonomy, competency and relatedness of the individual. When these conditions are lacking from a scenario, SDT theorists believe it will have a detrimental effect on the individual.

Formally SDT comprises five mini-theories which represent different facets of motivation or personality, as represented in Table 6 overleaf.

| | CONCEPTS | FOCUS |
|--|---|---|
| COGNITIVE EVALUATION THEORY (CET) | Considers the effects of social contexts, or the impact of rewards, on intrinsic motivation | <i>INTRINSIC MOTIVATION</i> |
| ORGANISIMIC INTEGRATION THEORY (OIT) | Posits that the more internalised the extrinsic motivation, the more autonomous the person and the less controlling the extrinsic motivator. Also considers the effect of social contexts and how these support or thwart internalisation. | <i>EXTRINSIC MOTIVATION</i> |
| CAUSALITY ORIENTATIONS THEORY (COT) | Assesses three types of causality orientations - autonomy orientation; control orientation focused on rewards, gains and approval; and impersonal / amotivated orientation where anxiety about levels of competency are explored. | <i>CAUSALITY ORIENTATIONS</i> |
| BASIC PSYCHOLOGICAL NEEDS THEORY (BPNT) | To ensure optimal well-being the needs of autonomy, competence and relatedness need to be met. The contexts that enhance or negatively impact on these needs are considered. | <i>PSYCHOLOGICAL NEEDS</i> |
| GOAL CONTENT THEORY (GCT) | Considers the impact of intrinsic and extrinsic goals on well-being and motivation. Extrinsic goals are said to have a less positive effect on well-being. | <i>INTRINSIC & EXTRINSIC GOALS</i> |

Table 6 - Summary of five mini-theories of Self Determination Theory

In summary, SDT offers a means by which it is possible to consider individual intrinsic and extrinsic motivation, as well as addressing psychological needs and/or goals. SDT also allows for the consideration of the social context within which the individual operates. For the research study this is advantageous. The individual academic is both a member of the KTP project and of the University. The social context is therefore relatively complex but SDT offers a potential means to consider how it supports or thwarts intrinsic motivation and more internalised extrinsic motivation.

Of specific interest to the study are the mini-theories of CET which is related to intrinsic motivation, and OIT which is related to extrinsic motivation. The remaining mini-theories, focused on orientation, needs and goals, are also relevant and reference will be made to them, followed by a more in depth focus on CET and OIT.

3.5.1 Free choice measure

“Choice” is an important concept relevant to SDT and intrinsic motivation and applicable to how this study has been conducted. Choice is generally measured experimentally via a “free choice” measure. In an experimental situation the individual is presented with a task then offered the opportunity to engage both with or without rewards being present. Of course, this process is not always appropriate in more applied research studies so the alternative of self reporting can be used. This is where the individual chooses to report their intrinsic motivation. The self report measure is most relevant to this study. The interview schedule used in the study is designed to elicit individual motivation to engage in KTP activity. The responses are analysed to demonstrate the extent to which engagement in projects is freely done, and in addition responses are analysed to see if interest and enjoyment in the projects is reported. The behaviour psychologists Locke and Latham (1990) are critical of SDT and the “free choice” measure. They believe SDT theorists fail to distinguish between liking an activity for its own sake, and liking it because it makes someone feel competent.

Locke and Latham (1990) also suggest that the “free choice” measure is an insufficient explanation for intrinsic motivation. They believe that people engage in activities for reasons other than interest, and that self efficacy (self-confidence specific to a task) is

more important than “free choice.” Cameron and Pierce (1994) and Eisenberger and Cameron (1996) also contradict SDT approaches, arguing that “When considering the time a person spends on a task, when offered financial reward intrinsic motivation is weakened, especially when the financial reward was expected and independent from performance” (Cameron & Pierce, 1994, and Eisenberger & Cameron, 1996 cited in Beswick, 2007). Within this study it will be possible to explore the intrinsic reasons why people engage in KTP activity, to see whether interest alone is the motivating factor, or whether Locke and Latham (1990), Cameron and Pierce (1994) and Eisenberger and Cameron (1996) have a claim to make, and that there are additional drivers.

3.5.2 The mini-theories of SDT

3.5.2.1 Cognitive Evaluation Theory

Cognitive Evaluation Theory (CET) (Deci and Ryan, 1985) predicts that socio-contextual factors either positively encourage or negatively affect intrinsic motivation and it was established “...to specify the factors in social contexts that produce variability in intrinsic motivation” (Ryan and Deci, 2000, p.58). The focus of CET is therefore intrinsic motivation and social contexts, and is relevant to this study because individuals work within the social context of the university and the KTP project. There are three important concepts in CET, namely, *relatedness*, *competence* and *autonomy*. With regards to competence, SDT theorists argue that where an individual engages in a task and receives, for example, positive feedback, the basic psychological need for competence will be satisfied and so the individual will be intrinsically motivated. Feelings of competence, however, will not enhance intrinsic motivation alone and must, Ryan and Deci (2000) argue, be accompanied by a sense of autonomy. Individuals must have an ‘internal perceived locus of causality’ (deCharms, 1968, in Ryan and Deci, 2000, p.58). To remain intrinsically motivated they must feel not just competent, but also that their behaviour is self-determined. Thus choice and self direction have a positive effect on intrinsic motivation because they provide the individual with a greater sense of autonomy. Threats and deadlines, in contrast, will have a negative effect on intrinsic motivation because they will be seen as controlling. Relatedness, the third concept, refers to the extent to which an individual feels connected and welcomed by a referent group. Relatedness is not about seeking status within a group, but rather is

a psychological sense of well being and unity.

As academics are working in a subject area in which they are knowledgeable it is expected that they will feel competent and, therefore, intrinsically motivated towards the KTP. Demonstrating their competence in a subject area, and having the freedom to decide how to approach the project planning and development, reinforces the sense of autonomy academics value as part of their role. The freedom, or autonomy to make decisions means that their behaviour will be self-determined and supportive of their intrinsic motivation. Feeling a sense of unity with the other KTP partners, because they are working on a common area of interest, enhances feelings of relatedness. This is also important for the maintenance and enrichment of intrinsic motivation.

3.5.2.2 Organismic Integration Theory

OIT deals specifically with extrinsic motivation. For SDT theorists, extrinsic motivation does not have to have a negative, undermining effect, on intrinsic motivation. It is possible for a person to be autonomous or self determined in their extrinsic motivation. In the case of KTP projects, academic partners complete their end of project reports because they are instructed to, as part of the management of KTPs. They know they have to comply with the external control. They have not internalised this behaviour and it is less self-determined than other forms of extrinsic motivation. In contrast, an academic might engage with a KTP project for its intrinsic value, for example it could be good for their career or good for their Department. They choose to be involved in the KTP and so are acting more autonomously than the previous example. Nonetheless because they engage for the good of their career, rather than because they find it inherently interesting, they are said to be extrinsically motivated and, as such, are less self-determined than would have been seen if they were motivated by interest.

SDT theorists developed a motivation continuum to explain their approach to the process of internalisation and regulation of behaviour in order to reach an autonomous state. Internalisation is "...the process of taking in a value or regulation, and integration is the process by which individuals more fully transform the regulation into their own" (Ryan & Deci, 2000, p.60). Below is their process represented diagrammatically in

Figure 6.

| | | | | | | |
|----------------------|---------------------|----------------------|------------------------|-----------------------|-----------------------|----------------------|
| Type of Motivation | Amotivation | Extrinsic Motivation | | | | Intrinsic Motivation |
| Type of Regulation | Non-regulation | External Regulation | Introjected Regulation | Identified Regulation | Integrated Regulation | Intrinsic Regulation |
| Quality of Behaviour | Non self determined | | | | Self-determined | |

Figure 6 - The Self-Determination Continuum, with types of motivation and types of regulation (Ryan & Deci, 2002, p.16)

It is not a developmental continuum per se. Over the period of a lifetime a person can change their social values, and, consequently, a behaviour regulation can become more integrated into their self. They will move from being externally regulated or controlled by the activity or reward, to a state of integrated regulated activity or reward, which has the least controlling effect. Of course not all activity will be fully internalised, and so the less it is internalised the more it is seen as controlling behaviour. Less internalised activity will not form the basis for autonomous self-regulation, but will be externally regulated and less self-determined.

OIT taxonomy consists of three types of integrated and regulated activity. The more the motivation for the behaviour comes from within, the more it is seen as being autonomous. Since 2002 the Motivation Continuum has been re-worked and now the taxonomy consists of 3, rather than 4, types of integrated and regulated activity. This is represented in Table 7 overleaf.

| | | | |
|---------------------------------|----------------------------|--------------------|------------------------------|
| EXTRINSIC MOTIVATION | | | |
| | <i>External Regulation</i> | <i>Introjected</i> | <i>Identified Regulation</i> |

| | | | |
|---------------------------|---|---|--|
| | | <i>Regulation</i> | |
| Definition | Motivated to obtain rewards. | Motivated to behave to avoid guilt or shame or to attain ego enhancements | Activity in congruence with own values, goals and needs. |
| Level of Autonomy | Least autonomous. | Degree of autonomy. | Most autonomous. |
| Locus of causality | Externally perceived locus of causality. | Partial internally perceived locus of causality | Internally perceived locus of causality. |
| Societal influence | Motivated to satisfy external demand or socially constructed contingency. | Seen as quite controlling. | Activity and behaviour not quite accepted as own. Done willingly but to attain personally important outcomes rather than for interest or enjoyment. |

Table 7 - Taxonomy of regulated Extrinsic Motivation according to Self Determination Theory definitions of Extrinsic Motivation (as per 2005 definitions)

The following provides an explanation of how the different forms of regulation might be applied in the context of KTP projects.

3.5.2.2.1 External Regulation

External regulated behaviour is defined as being where the individual is motivated to obtain rewards, or acts to satisfy an external party. In this study academics were asked about rewards and how these might affect engagement. Those people who are more externally regulated by rewards would, according to OIT and SDT, feel less competent in their handling of the KTP, feel they have less freedom and autonomy to deliver their

KTP, and fail to find a sense of unity with their project group. It will be interesting to explore how this applies to the academics interviewed.

3.5.2.2.2 Introjected Regulation

The individual is still to some extent controlled by external agencies and acts to avoid guilt or shame for not behaving in a certain way. In this study if an academic engages in a KTP because they believe it to be something expected of them by a senior manager, or because they feel it will enhance their status within the department or faculty, their motivation is being controlled. They may engage in the activity willingly, but may never feel entirely in control, or competent in delivering the project.

3.5.2.2.3 Identified Regulation

Identified regulation is the most autonomous form of regulation. The individual feels in control of their behaviour. If the academic feels obliged to publish research from the KTP because it is good for the KTP, the Department or the University, but is not particularly interested in doing so because it is not as highly regarded as journals with a high impact factor, publishing in this instance is a separable outcome. It is important that the individual feels competent in delivering the research paper, and has the autonomy to engage with the relevant bodies, in order to publish the research. Sharing research with referent groups means that the individual would feel a greater sense of unity with peer groups, and therefore a greater sense of relatedness.

Societal influence is important to all types of regulation. Ryan and Deci (2002) argue that "...the need for relatedness to others is centrally important for internalisation" (Ryan and Deci, 2002, p.19). The individual might be influenced to perform the activity for a reward from significant others, or they may watch a group performing an activity and want to fit in, thus feeling related to the group. In both cases they will perform the activity to gain implicit, or explicit, approval from the group. As a result they are unlikely to internalise it, unless they feel competent in doing the task, as Ryan and Deci (2002) suggest. Failing to internalise the activity could mean that the individual will not perform the activity, even with significant others present.

Ryan and Deci (2002) argue that autonomy is of central importance to the

internalisation and integration of behaviour. Basically, this means that when an individual experiences a degree of choice and freedom from external demands they are more likely to be able to embed the regulation of a behaviour into their inner self, so "...support for autonomy is the critical factor for determining whether the internalisation that is promoted by supports for relatedness and competence will only be partial (as in introjections) or will be much fuller (as in integration)" (Ryan and Deci, 2002, pp.19-20). It is therefore expected that where academics feel that they have the freedom to make choices and act autonomously in their KTP activity, their behaviour will be more internalised and integrated into their inner self.

3.5.2.3 Causality Orientations Theory

Causality orientations are, according to Deci and Ryan (1985), relevant to understanding the degree of self-determination an individual has, because they refer to the initiation and regulation of behaviour. Using the General Causality Orientations Scale (Deci and Ryan, 1985), it is possible to predict effects, cognitions, and behaviours, once the individual is scored according to their levels of autonomy, control, and impersonal orientations. The scale consists of twelve vignettes and thirty-six items, with three items (pertaining to autonomy, control, and impersonal orientations) following a vignette. The individual who completes the scale is scored on each of the three sub-scales and these results can be considered individually (per orientation) or collectively. The purpose of the scale is not to classify a person according to one type, but to measure the level of each orientation. An individual is therefore likely to be a combination of each of the three orientations.

Autonomy behaviours are said to be "...self-initiated and choiceful because they are part of a self-selected goal sequence" (Deci and Ryan, 1985, p.131). An individual exhibiting an autonomy causality orientation is more likely to be highly intrinsically motivated, and is "...more likely to interpret external contingencies like rewards as informational and supportive of their self-determination" (Hagger and Chatzisarantis, 2010, p.2). They are also likely to have a greater level of ego development and self-esteem. According to Deci and Ryan (1985) "...a strong autonomy orientation leads people to select jobs that allow greater initiative, to interpret their existing situations as more autonomy promoting, and to organise their actions on the basis of personal goals

and interests rather than controls and constraints” (Deci and Ryan, 1985, pp.111-112). Individuals with a control orientation are more likely to seek roles because of the pay or status attached to them. Control behaviour is seen as having an absence of choice, and the behaviour is “...shaped by external controls or by introjects of the external controls” (Deci & Ryan, 1985, p.131), even though the behaviour is intentional. Rewards and deadlines, and other external contingencies, for example, motivate a control orientated individual, and as long as there is a control present they will persist with the actions required of them. They are generally compliant but may rebel against the controls, and behave in the opposite way to what is demanded. Whether compliant or defiant, the behaviour is said to be controlled because “...compliance and defiance have a quality of being pressured and conflicted” (Deci and Ryan, 1985, p.112). Individuals exhibiting the impersonal orientation are seen to be passive, and experience little choice or competence. They believe themselves to be incompetent, and are often anxious about new situations or depressed about their current situation. This is the least self-determined causality.

According to Deci and Ryan (1985), whilst it might appear that the autonomy, control, and impersonal orientations can predict behaviour on their own, environmental factors also interact with causality orientations in order to determine the levels of intrinsic motivation an individual experiences. An individual who has a control causality may, for example, be intrinsically motivated, if they are in a particularly supportive environment which allows them to make their own choices, and allows them to determine their own behaviour. The General Causality Orientations Scale was not applied to the participants in this research study. An interest has been registered however in the environmental factors that support or thwart intrinsic motivation and an identification of individuals with autonomy, control, and impersonal orientations can be useful to see how these interact together.

3.5.2.4 Basic Psychological Needs Theory

According to SDT basic psychological needs (i.e. autonomy, competence, and, relatedness) need to be satisfied in order for a person to experience psychological well-being. When basic needs are satisfied a person experiences vitality, and will perform well in their job (Baard, Deci, and Ryan, 2004 cited in Milyavskaya and

Koestner, 2011), and find satisfaction in relationships (Patrick, Knee, Canevello, & Lonsbary, 2007, cited in Milyavskaya and Koestner, 2011). These needs are universal and studies have shown that it is necessary for individuals in all cultures to have these needs met, or be satisfied, for optimal functioning. Furthermore, optimal, or fully functioning (eudaimonic well-being) is preferred to a more hedonistic, subjective feeling of happiness.

Milyavskaya and Koestner (2011) considered autonomous motivation as a mediator between needs satisfaction and well-being. They found that autonomous motivation and well-being are significantly related to needs satisfaction but that multiple mechanisms, and not just motivation, are needed to ensure positive outcomes. They agree with Vallerand (1997) that needs operate by influencing motivation, which in turn influences outcomes, and with Deci and Ryan (2000), who suggest that fluctuations in need satisfaction will predict fluctuations in well-being. They suggest a means – a sort of spiral - by which different variables feed into each other starting with needs satisfaction, which leads to autonomous motivation, which in turn leads to autonomous involvement, followed by need satisfaction and well-being. It will be interesting to investigate the degree to which this ‘spiral’ applies to the data collected for this study, but the priority will be placed on identifying how basic needs are met, and to what extent motivation has a role in the process.

3.5.2.5 Goal Contents Theory

Goal Content Theory (GCT) has grown out of studies of intrinsic and extrinsic goals, and the differences between them, and the effect on well-being. Kasser and Ryan (Kasser & Ryan, 1993; 1996; cited in Gagne, 2014, p.21) describe these goals as intrinsic aspirations and extrinsic aspirations. Intrinsic aspirations are, for example, affiliation, personal growth and community contribution whereas extrinsic aspirations relate to wealth, fame, and image. It is expected that in this study individuals will demonstrate more intrinsic aspirations, due to the nature of KTP projects which emphasise affiliation, personal growth, and community contribution. If an individual is more extrinsically motivated to obtain the trappings of wealth and fame, Kasser and Ryan believe the individual will not experience eudaimonic, fully-functioning, well-being and is therefore more likely to slip into depression, experience anxiety and related

physical symptoms. Seeking extrinsic aspirations might be mildly satisfying but ultimately it does not lead to actual satisfaction. In contrast, intrinsic aspirations, they argue, enables an individual to self-actualise and have vitality.

3.5.3 Summary

The previous section has discussed why SDT is thought to be an appropriate theoretical means by which to study the motivation of an individual academic engaging in KTP activity. There are other theories of motivation, work motivation more specifically, which could offer alternative explanations. These will be discussed in the following section.

3.6 ALTERNATIVE APPROACHES TO STUDYING MOTIVATION

3.6.1 Hierarchy of Needs

Arguably the classic theory of motivation, especially for understanding human needs, is Maslow's Hierarchy of Needs, proposed in his 1943 paper *Theory of Human Motivation*. He presented five categories of need, and arranged them in a hierarchy suggesting that once a more basic need is satisfied, the individual is able to move to the next need level. At the most basic level the need is for food and water, to be able to breath and reproduce. These needs are the "...most pre-potent" and for someone lacking in all needs "...it is most likely that the major motivation would be physiological needs rather than any others" (Maslow, 1943, p. 5). Once this lowest order need is addressed then safety and security become important, followed by love and belonging, self-esteem, and finally self-actualisation, where the individual seeks self-fulfilment and in order to do so engages in problem solving and creativity. The diagram below illustrates the hierarchy:

ABRAHAM MASLOW HIERARCHY OF NEEDS

Maslow, A. *Motivation and Personality* (2nd ed.)
Harper & Row, 1970.

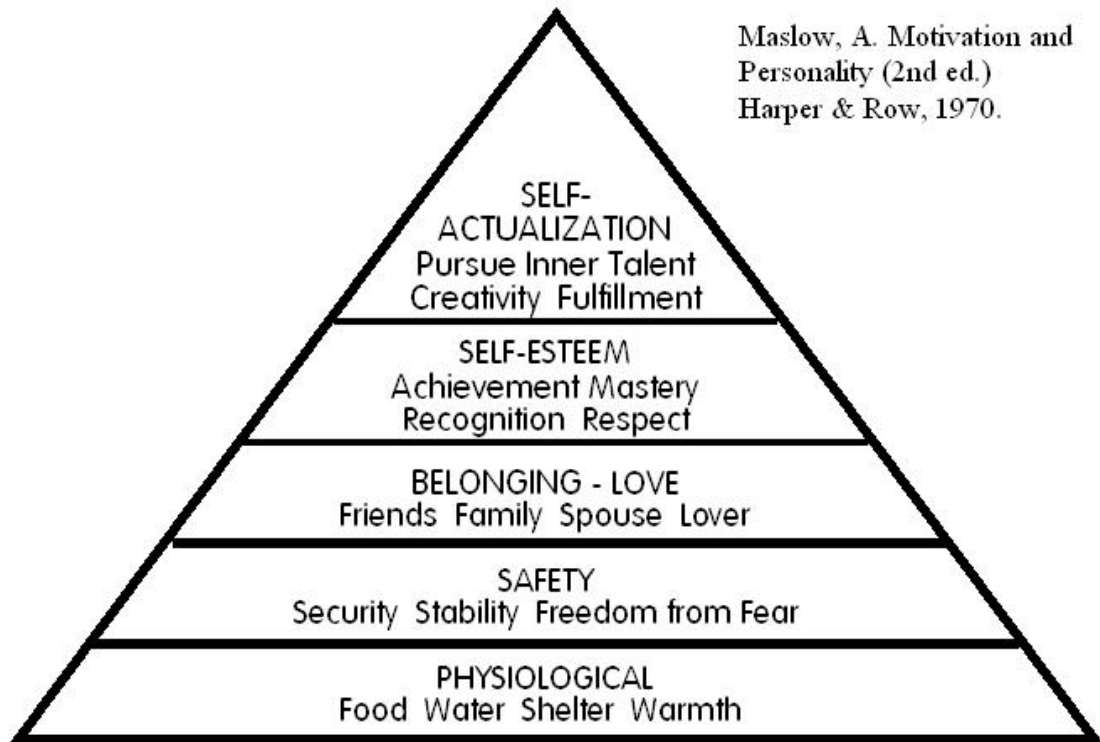


Figure 7 - Maslow's Hierarchy of Needs (1943), (cited in Kunc, 2012)

There are three distinct ways in which SDT differs from Maslow, explain Deci and Ryan. Firstly they suggest that the needs for security and self-esteem are not basic needs but "...need substitutes that result from thwarting of the basic needs" (Deci & Ryan, 2014, p. 15). When basic needs fail to be satisfied, they posit that people search for more self-worth, and self-esteem begins to grow. They argue that the most basic level of needs, the physiological needs (hunger, thirst, reproduction) are evident across a person's life, operating alongside the basic psychological needs. SDT therefore does not operate in a hierarchy, again differing from Maslow. The third difference relates to the degree of need satisfaction. SDT predicts work satisfaction and high-quality performance based on the extent to which the basic needs were satisfied, in comparison to Maslow's theory which considers need strength to be more important.

This study did not apply Maslow's theory as a means for understanding motivation

because it was felt that, firstly, it would be difficult to determine through interview whether an individual's physiological needs were met. Indeed it was felt it was inappropriate to ask when the focus is not on the individual's personal life, but on their working lives. Likewise it was felt that an interview concerned with the motivation to engage in KTP activity should focus on self-esteem, and although self-actualisation is something to aspire to it would be difficult to assess whether it can ever be properly achieved. It is therefore more appropriate to consider how self-esteem needs - achievement, mastery, recognition and respect – might be met as these are the essence of the relationships that take place within the partnership.

3.6.2 Two-Factor Theory

Another classic theory of work motivation is Herzberg's Two-Factor Theory (Herzberg, 1966). This theory proposes that that job satisfaction and job dissatisfaction result from different forces. Considering the diagram below:

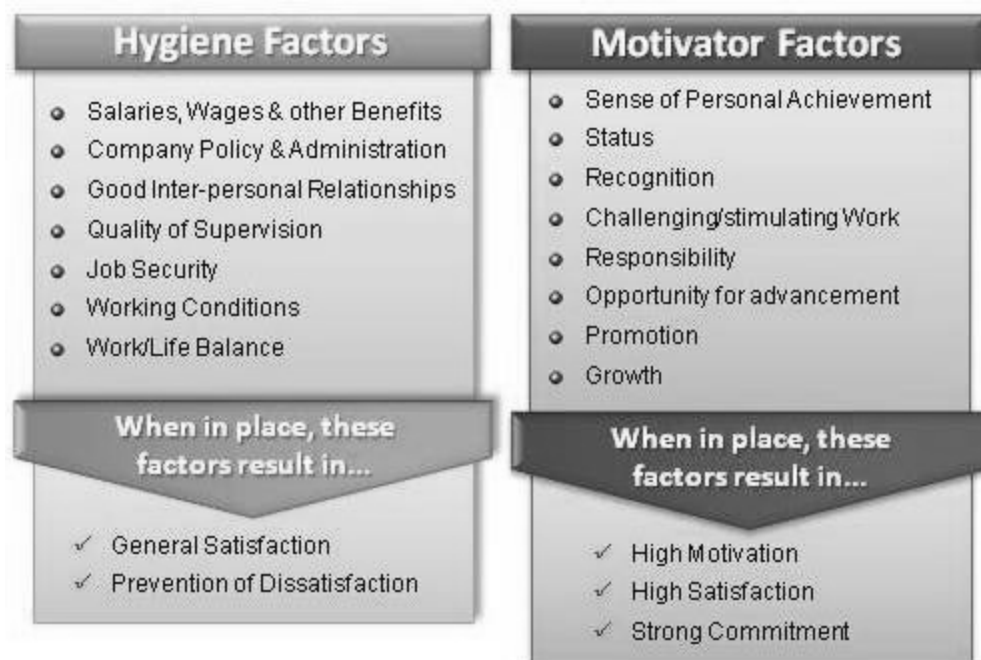


Figure 8 - Herzberg's Two-Factor Theory (cited in Dudovskiy, 2013)

Herzberg proposed that work motivation be understood in terms of hygiene and

motivator factors. Hygiene factors prevent general dissatisfaction and are related to the context of the job. They include salaries and wages, job security, working conditions, and work-life balance. Whilst they may lead to more satisfied staff they do not necessarily act as motivators. In contrast motivator factors, such as recognition, responsibility, and growth are seen as key to job enrichment. An effective workplace will invest in the hygiene factors, so will ensure salaries and wages are appropriate, that there is job security, and good working conditions for example. To ensure staff remain motivated and committed, however, managers need to consider the content of the job.

The decision to set aside Herzberg's theory for this study rests on comments made by Gagné and Panaccio who state that Herzberg's theory is rarely used nowadays because it has little empirical support (Gagné & Panaccio, 2014). They are also concerned that there are confusions between motivation and job satisfaction. They do, however, believe that it provides an opportunity to consider need satisfaction, along similar lines as Maslow's classic theory. Comparing Herzberg with Maslow they argue that the hygiene factors represent lower order needs in Maslow's theory, and the motivator factors represent higher-order needs, such as self-esteem and self-actualisation. Furthermore they suggest that the motivators, as positive characteristics of the job, contribute to intrinsic motivation and relate closely to ideas of relatedness as per SDT (Gagné & Panaccio, 2014, pp. 167–168). Whilst Herzberg's Two-Factor Theory might not have been used as the theoretical focus for this study, as Gagné and Panaccio suggest, there is value in understanding what positive job characteristics contribute to intrinsic motivation in order to understand how these can be enhanced to ensure strong commitment to the workplace.

3.6.3 Job Characteristics Theory

In the mid 1970s Hackman and Oldham developed the Job Characteristics Theory offering a model which specifies the work conditions in which an individual will get the most beneficial personal and work outcomes. It also looks at the relationship between individual variables and the 5 job characteristics as listed below:

- **Skill variety** – relates to the variety of skills required to carry out the tasks of the job. Interest in there being a variety of activities which means an individual employs different skills and talents
- **Task identity** – the extent to which an individual is employed in completing a task from start to completion
- **Task significance** – relates to how much the task has a substantial impact beyond just the individual. The extent to which it makes an impact in the wider world
- **Autonomy** – the degree to which the individual can choose how to organise and conduct their work. The extent to which the individual has freedom and independence.
- **Job Feedback** – relates to the feedback the individual receives on the effectiveness of their performance

Enhancing these characteristics means that the job is likely to motivate the individual more and therefore they are likely to experience three critical psychological states. These are shown in the model below:

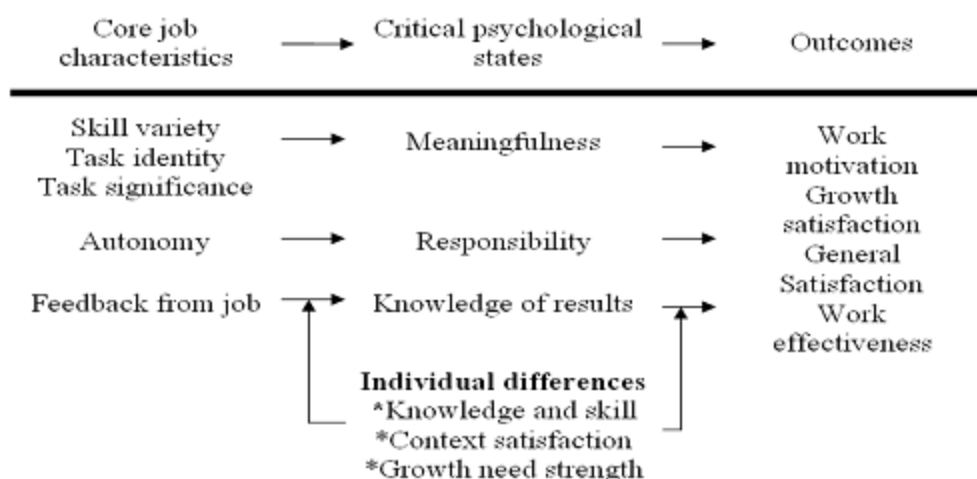


Figure 9 - Hackman and Oldham's Job Characteristics Model (1974) (as cited in "Organizational Behavior," 2015)

Of the critical psychological states meaningfulness relates to when the "...individual

perceives his or her work as important, valuable, and worthwhile,” (Gagné & Panaccio, 2014, p. 169). Responsibility is experienced when the individual feels accountable for their work, and knowledge of results is concerned with the individual recognising and understanding the extent of their effectiveness at work. When all three psychological states are experienced, the outcomes listed in the model above will emerge and the individual will be motivated (Faturochman, 1997, p. 2). With regards a comparison to SDT,

“...these positive psychological states are thought to result in increased internal work motivation, a form of motivation that, within the terms of SDT, can be considered to include both intrinsic and autonomous motivation”

(Gagne & Deci, 2005 cited in Gagné & Panaccio, 2014, p. 170)

Furthermore Job Characteristics Theory has similarities to SDT in its view that autonomous motivation is enhanced by supporting job characteristics. Where the two theories diverge is in how they deal with what mediates motivation, and how individual differences are seen as relevant. Whereas SDT proposes that motivation is mediated through autonomy, competence, and relatedness, Job Characteristics Theory suggest that it is mediated through the critical psychological states of meaningfulness, responsibility, and knowledge of results. As far as Job Characteristics Theory is concerned individual differences are more relevant to higher-order need strength, whereas SDT focuses on individual differences in need satisfaction. It is not that need strength lacks importance in SDT, but rather that the preferred focus is on the level of satisfaction necessary for optimal functioning (Ryan & Deci, 2000 cited in Gagné & Panaccio, 2014).

Gagné and Panaccio note that there are surprisingly few empirical studies which examine the mediating role of the three critical psychological states of Job Characteristics Theory. Job Characteristics Theory certainly could add value to an understanding of the different core job characteristics in evidence in KTP engagement, and the critical psychological states that these can lead a person to experience. It is also acknowledged that individual differences will affect an individual's motivation and

experience of a situation, and to consider these is therefore of importance. However SDT was considered a more appropriate theoretical focus because the basic need for autonomy, competency, and relatedness, were relevant to an understanding and explanation of motivation and engagement in KTP activity. The work of academics in partnership with the Associate and Company, have responsibility to the employers, but yet have the autonomy to explore alternative ways of working. Autonomy and freedom are, arguably, a central feature of academia and if this is challenged by the KTP activity, it could affect motivation. The level of satisfaction of these needs is therefore important, as is feeling competent, which can also be supported or thwarted by KTP engagement.

3.6.4 Summary

In the previous sections definitions of intrinsic and extrinsic motivation were considered, focusing particularly on SDT. SDT is a social psychological theory of motivation, which considers cognitive and social development. It was the preferred theory of motivation for this study but alternatives were also considered including Maslow's Hierarchy of Needs, Herzberg's Two Factor Theory, and Hackman and Oldham's Job Characteristics Theory. The alternative theories are rarely used nowadays, compared to SDT. They lack evidence, a key reason for setting them aside in order to better understand individual academic motivation in the KTP context.

3.7 PRIOR STUDIES: MOTIVATIONS & IMPEDIMENTS

It is important to explore research that has also considered the motivation of individual academics engaged in knowledge transfer activity because in so doing this identifies commonalities, differences, gaps for new research, and key issues that have arisen from prior research. These findings might have relevance when considering individual academic motivation in the context of KTPs.

Although there are no specific studies of motivation with respect to KTPs, research into motivation and knowledge transfer has been undertaken in the following contexts:

- motivation as a means to lower barriers to knowledge transfer (Bruneel, D'Este, & Salter, 2010) and reduce tensions (Samson et al, 1993);

- the motivations of different participants (Lockett, Kerr, & Robinson, 2008);(Ankrah, Burgess, & Shaw, 2007); (Van Horne, Poulin, Landry, & Frayret, 2008)
- the motivations of entrepreneurial academics compared to non-entrepreneurial academics (Rherrad, 2009);
- taxonomies of motivation in the context of technology transfer (Kumar, Motwani, & Reisman, 1996);
- the management of motivation (Rowley, 1996); (Meyer & Evans, 2003); (Perkmann & Walsh, 2007); (Hendriks, 1999); (Khojasteh, 1993); and,
- motivation as an important part of knowledge management in construction (Egbu, 2000).

Much of this research has focused on patenting and innovation (D'Este & Patel, 2007); (Perkmann & Walsh, 2007). Whilst the research study is interested in a different aspect of university-industry collaboration, namely KTPs, it will still look at the broader context of knowledge transfer to understand the kind of conditions that dictate the way in which an academic might be motivated to transfer knowledge to business. In the Discussion chapter the variables identified here will be compared with data from the Data Analysis chapter to see the similarities and differences that exist, and this will contribute towards the formation of a series of recommendations designed to build on identified intrinsic and extrinsic motivators, and barriers to motivation found during the comparison.

3.7.1 Intrinsic Motivation

There is direct and indirect mention of intrinsic motivations for academics engaging in university industry collaborations. Lam (2010) for example interviewed 36 'elite'¹

1

academics and found that, whilst many were motivated by more extrinsic motivators such as opportunities for research commercialisation, there were academics who pursued research collaborations with industry because they found it interesting. Likewise Andrews, Weaver, Hanley, Shamatha, & Melton (2005), who studied the motivations of US science academics engaging in outreach with schools, found that the strongest motivators were the desire to contribute and enjoyment of the outreach experience.

The opportunity to acquire new knowledge appears to be a key reason for academics being intrinsically motivated by collaborations. (D'Este & Perkmann, 2011) regarded these as learning motivators. From these "...interactive, 'bench level' relationships with industry" (D'Este & Perkmann, 2011, p.20) the academics learnt to apply new ways of working. For many, problem solving, as well as new ways of working, was an interesting challenge, and the novelty of learning and applying newly acquired knowledge was intrinsically motivating. Curiosity is an interesting intrinsic motivator. Wang and Noe (2010) found that individuals motivated by knowledge sharing were more likely to display a strong learning orientation. They also found that this curiosity and motivation to explore new experiences led to individual experiencing an enhanced self-perception of competency, credibility and confidence.

Lacetera (2005) also looked at knowledge and particularly how individuals share knowledge and was interested in the effect this had on motivation. She compared entrepreneurial academics with industrial participants and found that academics choose projects where there were higher rates of returns, that is they were extrinsically motivated. It led her to draw the conclusion that self-selection of projects was a consideration of when academics were successful. This is an indirect reference to intrinsic motivation. In some respect academics have the autonomy to select projects and set their own goals and targets, so long as they are in line with departmental targets and the mission of the institution. Exerting their autonomy and having the freedom to choose whether or not to be involved in a project is, for many, intrinsically motivating.

Whilst some claim that academic entrepreneurialism is not congruent with the traditional role of academics, there is research from D'Este and Perkmann (2011), Gee (2001) and Lam (2010) which would appear to agree that most individuals engaged in knowledge transfer felt it complements traditional academic norms. It does this by reinforcing the individual's feelings of competency. By working externally the academic gains new knowledge and better understands the nature of the problems to be addressed. Feelings of competency increase with further engagement on the project, enabling them to communicate in a language understood by industry. This is particularly important if barriers to knowledge transfer are to be broken down.

3.7.2 Extrinsic Motivators

From the prior studies of motivation and knowledge transfer there is a series of extrinsic motivators evident. When Lam (2010) interviewed 36 'elite' academics she found that there was more evidence of motivation towards opportunities for research commercialisation and access to funding, than evidence of being intrinsically interested in the activity itself. This is confirmed by Lacetera (2005) who found that academics will self-select projects because of the likely high returns such as research publications or additional funding.

Research studies (Dietz & Bozeman, 2005); (Lam, 2007, 2010) suggest that prior experience acts as an indicator as to whether an academic will engage with industry. Previous experience builds social capital in terms of access to a variety of social networks (Dietz and Bozeman, 2005), needed for “boundary spanning individuals” (Daft, 1989), individuals who work across boundaries internally, and externally, in order to exchange knowledge and to communicate between the cultures of different organisations. This is extrinsically motivating because it can mean access to new sources of research funding or collaborations. Having an extensive network of contacts also provides greater opportunities to be involved in projects which the individual self-selects. When these projects are successful this both protects individual academic reputations and also creates opportunities for new collaborations and new sources of funding.

SDT suggests that individual needs are met when behaviour takes place in a supportive environment. Wang and Noe agreed and found that organisational contexts also encouraged knowledge sharing (Wang & Noe, 2010). For example where organisational values were supportive and there was a culture of trust, co-operation and innovation, this encouraged the development of new ideas and had a positive effect on knowledge sharing. Management support which was specific to knowledge sharing affected the level and quality of the knowledge shared.

Wang and Noe (2010) considered the effect of entrepreneurial behaviour and concluded that teams need to be well established, and when there is a connection between knowledge provider and recipient, then individuals are most motivated by knowledge sharing. This is a form of the need for relatedness, a basic need for motivation and for a person to be self-determined. When individuals feel isolated, or in a minority in a team, then they are less likely to share their unique knowledge and less likely to disagree with the decisions made. The feelings of responsibility imbued from knowledge sharing are said to be extrinsically motivating, giving the individual feelings of self-worth for example.

Other extrinsic motivators that are less tangible include the extent to which the entrepreneurialism is influenced by the behaviours of others (Bercovitz & Feldman, 2006, 2008; Tartari, Salter, D'Este, & Perkmann, 2010). Bercovitz and Feldman conducted two separate studies in 2003 and 2008 and found that adoption of knowledge transfer as an academic norm (as research and teaching would be regarded) is dependent upon where the individual had trained, and then dependent on whether the head of the Department was committed and engaged in knowledge transfer. Aschoff and Grimpe (2011) agree but add that "professional imprinting" in respect to knowledge transfer takes places at an early stage in an academic career which suggests that the younger the academic is, the more likely they are to be influenced (or motivated) by peer pressure. According to Wang and Noe (2010) where the employee perceived that the manager had knowledge and expertise, and access to suitable rewards for sharing, then self-reported knowledge sharing was greater. Gagne and Deci (2005) suggest that this is when "identified regulation" takes place,

and the activity is in keeping with the personal values of the individual.

3.7.3 Barriers to motivation

Asking the more traditional lecturers and researchers to be entrepreneurial could affect their motivation in the workplace. Lee (1996) for example, used data from US universities to conclude that faculty in higher ranked institutions tended to favour academic entrepreneurialism less than academics at lower tier universities, because of the fear it would restrict academic freedom. Individuals will seek to engage in activity which matches their preconceptions. If they do not feel that engagement in industry is complementary, then they are more likely to avoid such involvements.

Bercovitz & Feldman, (2008) also considered what happened when engagement in activity was in conflict with the experience of the individual. If the academic has prior experience of engagement with industry but works in a Department which is not supportive the academic will conform to localised social norms. This conformity could be substantive (in action) or symbolic (in spirit only) so there might be instances when an academic would engage with industry in any case. When an individual does not feel that being entrepreneurial is part of their role, or they feel unsupported, however, they are not likely to be motivated by engagement in such activity.

Lacking the right language with which to communicate with industry can also be a barrier to motivation. Often the social networks of SMEs and institutions do not overlap so academic-practitioner relationships can be difficult. Academics therefore need the support of intermediaries (Ankrah et al, 2007; Lockett et al., 2008; Wright, Clarysse, Lockett, & Knockaert, 2008) such as Technology Transfer Officers (TTO), who understand the motivations and intentions of all those involved. The TTO should be “experts” in their field and the knowledge they communicate should be appropriate rather than over simplified, reduced or filtered (Van de Ven, 2007). Such an action would lead to a better understanding of academic-practitioner relationships (Rynes, Bartunek, & Daft, 2001) and barriers to effective knowledge sharing would be reduced.

Lockett et al (2008) identified the lack of incentives for knowledge transfer as a barrier

to engagement. Whilst collaborations resulting from networking can lead to academic outputs, referred journal publications tend to be more highly regarded, but are also more difficult to achieve from knowledge transfer activity (Lockett et al., 2008, p. 10). Lin & Bozeman, (2006) found that those with prior industrial experience produce fewer total publications in their career when compared to those with no experience. This is probably explained by the fact that academics engaged in knowledge transfer will be working on projects where, for example, it is not possible to publish results or, due to the pressure of the project to meet financial objectives, there have been no opportunities to publish. But, interestingly when a five year snapshot was considered prior experience was not actually disadvantageous and there was no difference between the engaged academics and the non-engaged. This suggests that in the career of an engaged academic there might be certain hiatuses where there is more pressure to publish, for example at the beginning of their career,. It will be interesting to see if any further conclusions with regards this can be drawn from the case studies.

Research has shown that if individuals perceive knowledge as a means for achieving upward mobility they were less inclined to share (Burgess, 2005). If this holds true it means that if involvement in KTPs is to have a positive effect universities will need to consider how they reward their academics. Withdrawal of financial rewards could see academics engaging in KTPs only because they want to improve their academic status. When the pressure of research funding or publishing is removed, such as in the case of Outreach, a form of community engagement popular in US and Australia, the motivations for engagement appear different. Andrews, Weaver, Hanley, Shamatha, & Melton, (2005) studied the motivations of US science academics engaging in Outreach with schools and argued that the strongest motivators were the desire to contribute and the enjoyment of the outreach experience.

3.7.4 Summary of findings

The findings from the prior studies is summarised in the table below:

| INTRINSIC MOTIVATION | | | EXTRINSIC MOTIVATORS | | |
|----------------------|-------------|----------|----------------------|-------------|----------|
| Complements | traditional | academic | Complements | traditional | academic |

| | |
|---|--|
| norms – enhances feelings of competency | norms – activity aligned to teaching & research |
| Intrinsic value of activity – interested in the activity | Pursue activity for purposes of research commercialisation |
| Boundary spanning individual – enjoys connecting between academic and business world | Past experience – ethos of where academic trained can act as extrinsic motivator |
| Feeling competent to communicate in a language understood by all parties – reduces barriers to engagement | Head of Department committed academic entrepreneur |
| Gaining new knowledge and insight – naturally curious | Professional imprinting – early stage of academic career |
| Desire to contribute | Prior experience – builds social capital |
| Autonomy to set own goals and targets | Prior experience – access to social networks to provide opportunities for involvement in enterprise activity |
| Finding new ways of working from feedback from industry | Support from Technology Transfer Offices – to understand motivations and intentions of all parties and ensure knowledge is produced and shared to benefit of all |
| Novelty of new research projects and applications for technology | Successful projects due to self-selection of projects where there are higher returns |
| | Successful projects which are self selected means that academic reputations are protected |
| | Good academic reputation will lead to academic winning further research grants |
| | Gaining feedback from industry – in future can apply new ways of working to |

| | |
|--|----------------|
| | benefit of all |
|--|----------------|

| |
|---|
| BARRIERS TO MOTIVATION |
| Fear it will restrict academic freedom |
| Effect of localised social norms - Working in environment which is not supportive of academic entrepreneurialism |
| Cultures of different organisations – do not develop language for effective knowledge transmission |
| Pressure to meet financial objectives – barrier to producing academic publications |
| Secrecy of knowledge transfer activity – barrier to producing academic publications |
| Removal of financial rewards – academics involved in knowledge transfer only because it might enhance academic status |

Table 8 - Summary of Intrinsic Motivation, Extrinsic Motivators and Barriers to Motivation from prior studies

These findings will be used to compare with those collected from the interviews with academics involved in KTP activity. As each individual is involved in a project with its own interests, relationships, process, procedures and challenges it is expected that not all of the intrinsic motivations, extrinsic motivators and barriers to motivation will be found and instead there may be other unexpected intrinsic motivations, extrinsic motivators and barriers to motivation found. Indeed this is an expected outcome of theory development.

3.7.5 Summary

This section of the study has demonstrated the importance of studying motivation and knowledge transfer. Motivation is a complex, multi-theorised concept and the individual theoretical views mean that it is difficult to consider every component part. It is agreed that academic motivation for knowledge transfer is a complex issue, operating at the level of the individual, the project and the organisation. In order therefore to be able to consider all aspects equally the research study seeks to integrate both content and process theories of motivation, and consider these at the level of individual, the project

and the university. This will be achieved through a series of case studies which will be discussed in the following chapter.

3.8 CONCLUSION

Intrinsic motivation is concerned with a desire and willingness to engage in an activity, and resulting in the individual finding the activity interesting, enjoyable, and satisfying. Extrinsically motivated activity, which is related to a desire to obtain external rewards and which was once thought to have a negative effect on intrinsic motivation is, according to SDT, less likely to have an adverse affect when the environment is supportive, and the individual feels they are competent and freely engaging in the behaviour. SDT, as a meta theory of motivation and concerned with cognitive and social development, was thought appropriate for this research study because it allows for an exploration of individual differences, showing how the need for autonomy, competence, and relatedness is satisfied.

Prior studies of individual academic motivation and engagement in university-industry collaborations were also considered in order to determine both the intrinsic and extrinsic motivators and the barriers to motivation for academics engaging in KTP activity. These will be identified and reflected on in relation to SDT, and the findings will be detailed and discussed in the chapters which follow.

4 – Methodology

4.1 INTRODUCTION

The purpose of this chapter is to outline the research process and the methodology adopted in this study. The following will be considered:

- The research philosophy including epistemological, ontological and axiological concerns;
- Inductive theory building versus deductive theory testing;
- Strategies and approaches;
- Data collection procedures

The research process and the methodology, are designed to identify the intrinsic and extrinsic motivators and the barriers to motivation for academics engaged in KTP activity. This is a key objective of the study.

There are two areas of interest – the individual, and the context. The context in which KTPs operate mean that it is important to consider the structures and processes at work, because they could create either motivating environments, or environments which thwart motivation. By analysing qualitative interview data and comparative case studies, this non-experimental study of individual motivation aims to be able to accommodate the individual and contextual issues.

4.2 THE RESEARCH ONION

Saunders et al (2009) present a 'research onion' (Figure 9) so called because in the process of determining the methodology, layers of understanding are peeled away in order to address issues related to research design, which include epistemology and ontology and data collection. It is a useful way of thinking about the design of a research study as it avoids the temptations of considering data collection and analysis before making decisions about appropriate research philosophy. Research philosophy is the outer-most whereas data collection and analysis are the innermost layers of the 'onion'.

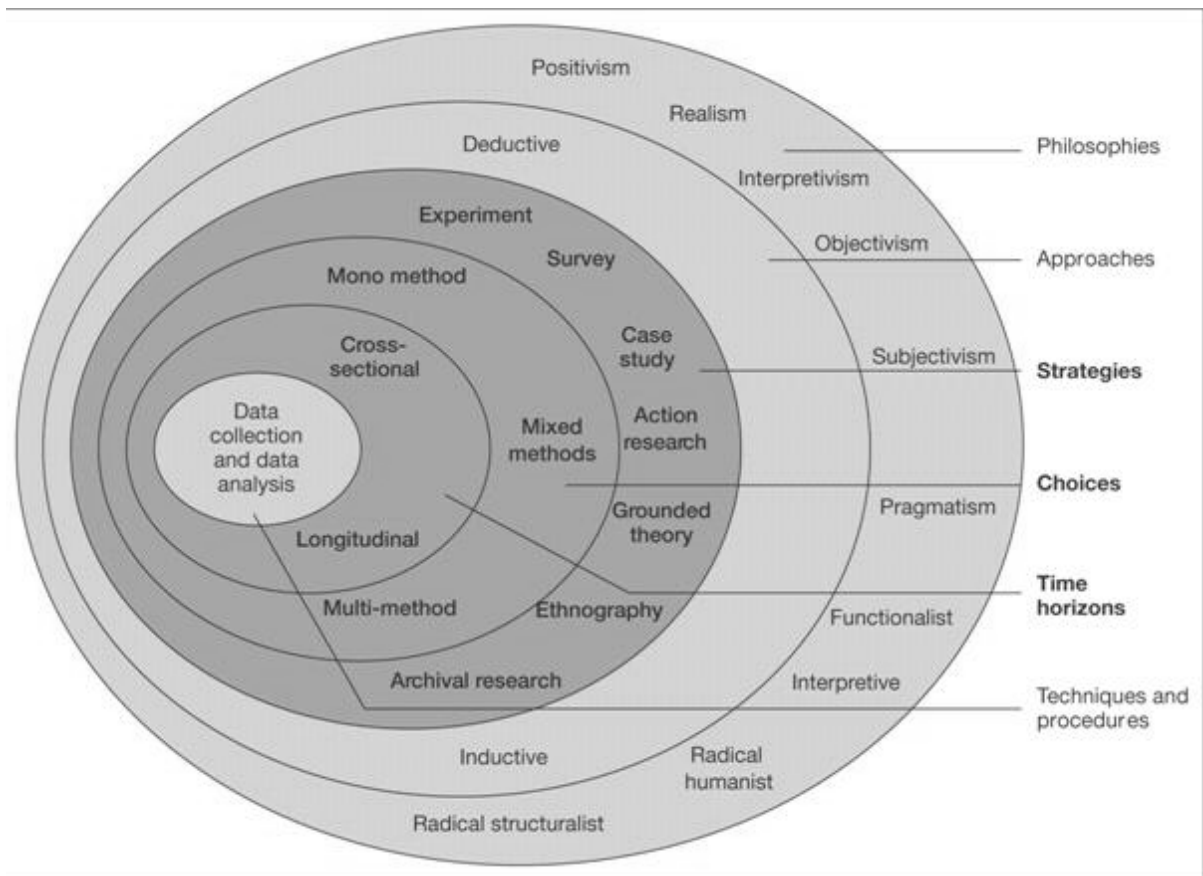


Figure 10 - The research onion (Saunders et al., 2009, p. 3)

4.3 DEFINING THE RESEARCH PHILOSOPHY

Establishing the research philosophy is important because it dictates the methods chosen to collect and analyse data. As Saunders et al (2009) suggest, there may be practical considerations but it is more likely that the decision will be influenced by the way in which the researcher views the relationship between knowledge, and the process by which it is developed. These epistemological, ontological, and axiological issues are considered in the following sections.

4.3.1 Epistemology

The research paradigm will answer the epistemological question:

“What is the nature of the relationship between the knower or would-be knower and what can be known?” (Guba & Lincoln, 1994)

Epistemology is concerned with what is acceptable knowledge, and what the relationship is between reality (as defined in the ontology) and the researcher (Healy

& Perry, 2000, p. 119). It is dependent on how the researcher views the importance of facts over feelings, data over emotions.

4.3.1.1 Epistemology and Self Determination Theory

The epistemological stance taken in the majority of SDT studies follows the principles of positivism. Positivism is the stance of natural scientists where phenomena is observable and testable, data can be collected, and hypotheses developed and tested and accepted or refuted. This is confirmed in an article by Ryan and Niemiec discussing the epistemology of SDT, in which they state,

“...SDT is unabashedly a strong empirically based theory, making explicit assumptions about human nature and proposing testable hypotheses...” (Ryan & Niemiec, 2009, p. 264)

Their reflection on the epistemological nature of studies in the SDT domain is interesting because even though SDT is a theory, they state that a central tenet is,

“...the importance of sharing in people's internal frame of reference as a starting point for understanding their motivations and supporting their autonomy” (Ryan & Niemiec, 2009, p. 266)

which is counter to traditional versions of positivism which are concerned with observable social reality. They, therefore, use a less rigid version of positivism, but do not accept an interpretative epistemological position because they believe in the strength of generalization. Autonomy, competence, and relatedness, the three basic psychological needs, are deeply evolved and developmentally persistent, and part of our common nature. In any culture psychological needs are objective because if an individual is deprived of the chance of their needs being supported, there will be noticeable effects on growth, integrity and wellness. They believe this to be true because SDT is a “truly *dynamic* theory of motivation” (Ryan & Niemiec, 2009, p. 268) and psychological needs are universal across all cultures. An interpretative epistemological stance would reject this and argue that the researcher is too embedded in his or her own historical, cultural, environmental, and personal biases that it is right to be sceptical of the ability to generalise to a community.

4.3.1.2 Epistemology and the research study

Ryan and Niemiec comment that SDT fields studies are "...primarily (although not exclusively) supported through quantitative methods" (Ryan & Niemiec, 2009, p. 264). By quantitative studies they mean either experimental research designed to assess the impact of external controls on intrinsic motivation, or self report questionnaires designed to understand both intrinsic and extrinsic motivation. This suggests that qualitative studies have been designed in the past, and this quote is used to justify the fact that this research study is an example of a qualitative, non-experimental study, rather than a quantitative, experimental study. It is not, however, fitting to adopt positivism as its epistemological position as the focus is on analysis of qualitative data. Likewise, the decision has been made to avoid a critical theorist or social constructionist epistemology, even though these are typical in the qualitative field. The research study is not concerned with transforming values which is found in critical theory. Nor is there an interest in understanding the multiple ideologies and values of individuals, as is typical of social constructionism studies. Instead realism, specifically critical realism, is adopted as the epistemological stance. This provides the opportunity to study perceptions, by stating that things are not experienced directly, but rather it is the sensation of things; in other words, a window on reality that is provided.

Critical realism suggests there is a real world to discover, but that there will be an imperfect understanding of it, because many aspects are abstract. Our senses and sensations are only able to tell us so much, and we will need time to process and understand. Saunders et al (2009) also comment on direct realism which argues that our senses convey our world accurately, and require no extra interpretation or reflection. For direct realists the world is relatively unchanging. This is a statement with which critical realists would disagree arguing that the world we see operates at multiple levels, and these constantly change in emphasis, and on the effect on each other.

Critical realism is appropriate for this research study because:

- It relates to scientific enquiry (Saunders et al., 2009, p. 6) and therefore has some correspondence to positivism, but as it is interested in senses and the mental processes by which meanings are processed; this is felt to be more

relevant to understanding human motivation;

- Studies of SDT which apply either self-report questionnaires or experimental research methods are positivist and interested in generalising and looking for causes for behaviour. This study is interested in understanding why academics are motivated to engage in KTP activity, and to consider what causes their continued motivation or causes it to be thwarted. Research that considers autonomy, competence, and relatedness constructs has not been applied to the KTP context before. This theory of the causes of motivation maintenance or thwarting, built on the SDT theoretical base, needs to be considered, before it is possible to consider generalising to a population;
- Critical realism places importance on understanding the multi-layered nature of society. This means that it is necessary to consider the individual academic and how they operate within the KTP and the university setting. Each setting, or layer, can have an impact on another and can change how an individual, structure or process operates. If the purpose of the research study is to understand why an academic is attracted and motivated by involvement in KTP activity and to understand how they maintain, or have their motivation thwarted, then it is argued that the complex relationship between the individual, the KTP project, and university, represents an ideal opportunity to apply a (critical) realist epistemology.

4.3.2 Ontology

The research paradigm will answer the ontological question:

“What is the form and nature of reality and, therefore, what is there that can be known about it?” (Guba & Lincoln, 1994)

Ontology, then, is, as Healy and Perry suggest, the “reality” that researchers investigate and, like epistemology, it has an affect on decisions made when designing the research methodology.

4.3.2.1 Ontology and Self Determination Theory

In the same way that it is important to understand the epistemological stance taken in SDT, it is also important to gauge the ontological position and understand how “reality” is perceived. Whereas the epistemology of SDT is positivist, believing all findings to be true and testable via experimentation or self-reports (thus avoiding researcher bias), there are indications that SDT follows a more (critical) realist version of ontology. One reference stands out to support this proposal:

“...unlike many empirical approaches, SDT's understanding is not that environments directly control behaviour, but rather that social contexts affect people's *experience* and, moreover, their satisfaction of some very basic psychological needs” (Ryan & Niemiec, 2009, p. 265)

Additionally they reflect on the tendency of qualitative (or in paradigmatic terms, constructivist) researchers to assume that no reality exists, apart from their own perceptions. Reality is therefore different for each individual, and validity and generalisations cannot be drawn because the researcher themselves are biased by reason of their own personal, cultural, and historical mores. Ryan and Niemiec (2009) sympathise with the view that individual meaning or experience can shape behaviour, but they clearly reflect realist values when they comment,

“there is a strong assumption within SDT that people internalise ambient cultural values and ideologies, which in turn shape, influence, and / or organise their perceptions and experience. These cultural ideologies and values can be more or less problematic for the flourishing of motivation and wellness” (Ryan & Niemiec, 2009, p. 267)

The next section will discuss in more detail Popper's (1978) three world view, which puts forward the opinion that “reality” exists in the actual, the mind, and objective knowledge. According to Popper, the world of objective knowledge is where cultural values and ideologies shape perceptions and experiences, and this is similar to the (critical) realist view of reality.

4.3.2.2 Ontology and the research study

As already discussed by establishing the ontological stance it is possible to discern

what “reality” the researcher is interested in investigating. This research study adopts a more pragmatic version of realism as its ontological position. Realists argue that, “reality is *real* but only imperfectly and probabilistically apprehensible” (Healy & Perry, 2000, p. 119) which is different from the positivist view that reality is real and apprehensible or the constructionist view that there are multiple local and specific “constructed” realities (Healy & Perry, 2000, p. 119). Tashakkori and Teddlie (1998) suggesting thinking of research philosophy as a continuum where,

“...at some points the knower and the known must be interactive, whilst at others, one may more easily stand apart from what one is studying”

(Tashakkori and Teddlie, 1998 cited in Saunders et al., 2009, p. 12)

A more pragmatic version of realism means that it is still possible to consider what is imperfectly real, but also be alive to multiple local and specific constructed realities. This approach benefits the research study because it means that it is possible to understand social institutions and cultures, whilst also considering individualist reality.

Popper (as quoted in Healy and Perry, 2000) provided a means to understand the difference between, and interaction of, three worlds of reality. This is summarised in the figure 11 overleaf. World 1 is the world of physical objects and events, including biological events. This world is objective and positivist. World 2 is representative of the mental world, and matches with constructivist ontologies. Realism is represented by world 3, the world of abstract ideas born of the mind but is also autonomous of any one person. These abstract ideas are cultural, collective, and social, rather than individual. Each world supports the other, with, for example, world 1 being causally dependent on world 3 because world 3 gives extra meaning to objects generated in world 1. Likewise objects in world 2 are causally dependent on world 1, because ideas of the mind could not exist without world 1. Furthermore, in order for world 3 objects to be developed they require the mind to think over the ideas, and consequently world 3 is causally dependent on world 2. The chain of causal dependence can go up and down between the three worlds.

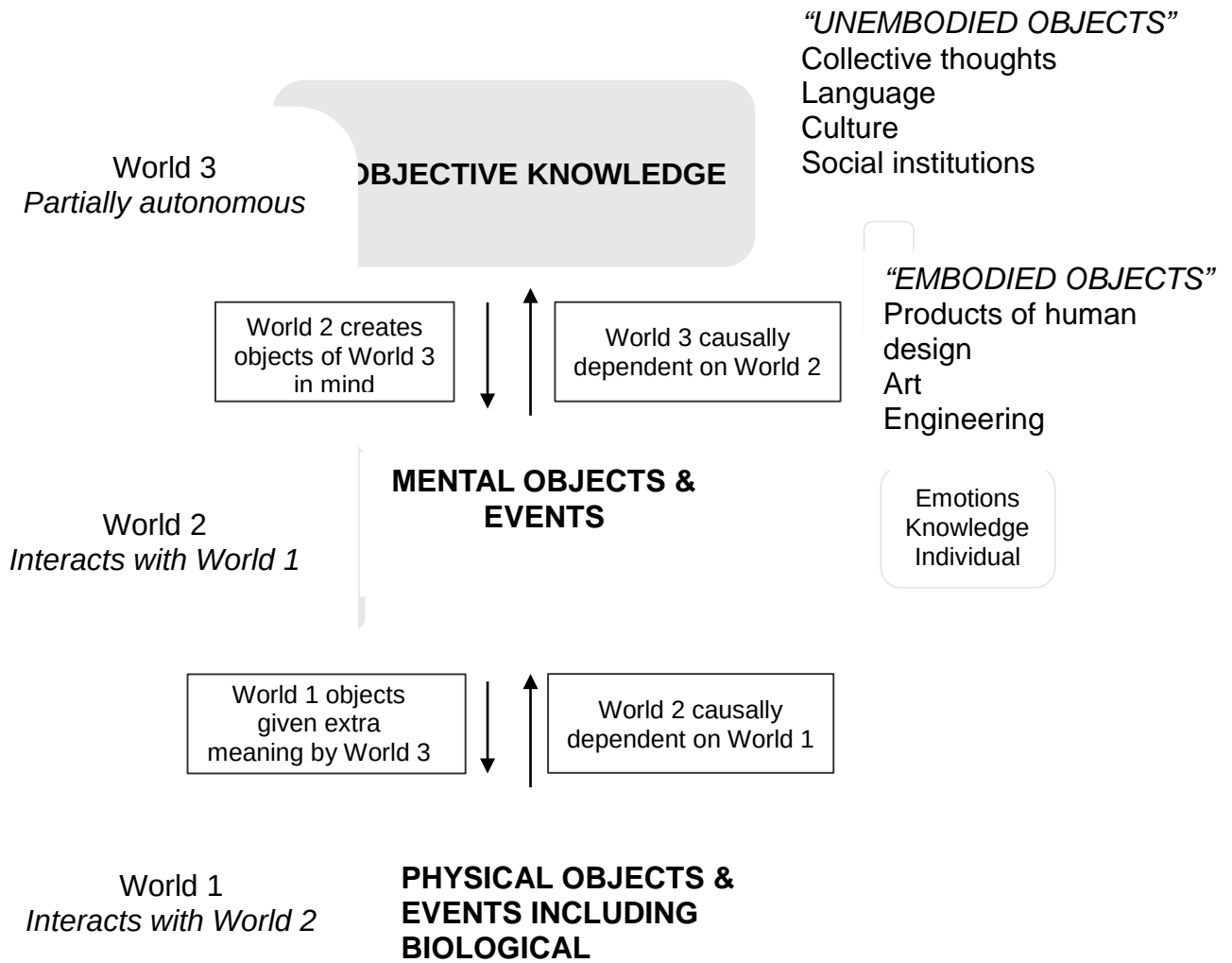


Figure 11 – Popper's Three Worlds (cited in Healy & Perry, 2000)

Pragmatic critical realism is appropriate for this research study because:

- It provides a means of viewing reality beyond individual perceptions. For positivists, reality can be seen and data does not change when the researcher studies the events. In contrast, constructivists argue that the researcher needs to understand the values and beliefs held by the participants, in order to be able to properly interpret the data. Consequently the researcher becomes a “passionate participant” (Guba & Lincoln, 1994, p. 112). It is important for this work that the researcher understands the values and beliefs of the individuals, and understands how her own experience might impact on her interpretation of the research. It is also argued that “real” issues about culture and social institutions have an impact on motivation to engage in KTP activity, and therefore a pragmatic critical realist ontology is important.
- SDT theory clearly supports the notion that social contexts, rather than physical environments, affect people's experiences. These social contexts could occur in the university setting or the KTP project, and an ontology that provides a means by which to view realities beyond individual perceptions is important.
- Healy and Perry suggest that causal impacts are not fixed but depend on the environment and consequently, no direct cause and effect paths exist (Healy & Perry, 2000, p. 123). Like constructivist philosophy, SDT argues that social contexts rather than environments are what affect the experiences and motivation of people. Pragmatic critical realism is appropriate because, by providing the opportunity to consider the affect of the environment, the debate about the appropriateness of SDT for studying motivation in KTP engagements is broadened and the applicability of SDT to environments beyond their traditional domains is tested.

4.3.3 Axiology

Axiology considers the role a researcher's own values have on decisions made during the research process. In this research study the aim is to gain a detailed understanding of why academics engaged in KTP activity, and how it motivated them. In order to do this the researcher will adopt realism as the epistemological stance and modified

realism as the ontological position as more traditional studies using SDT emanate from a positivist point of view and do not tend to encourage qualitative research. Nevertheless it is important to interview participants rather than get them to complete an email questionnaire because motivation is a personally felt concept and probe questions are needed to help explore the issues raised. When writing the narrative for the data analysis the researcher intends to provide examples from the participants and will interpret the discussions fairly whilst acknowledging that personal experiences could have an impact on the analysis of the data.

4.3.3.1 The Researcher self

Reflexivity is defined as “...our human capacity to consider ourselves in relation to our contexts; and our contexts in relation to ourselves” (Longhofer, Floersch, & Hoy, 2013, p. 140) and, in methodological terms, it provides researchers with a way of ensuring research is carried out in a manner which is sensitive to its surroundings. Longhofer et al claim that genuine engagement requires epistemological, ontological, methodological, analytic, normative and representational reflexivity, which should be conducted autonomously (Longhofer et al., 2013, p. 141). Previous sections have discussed epistemological and ontological standpoints with respect to the research study adopting critical realism. The following section considers methodological reflexivity which is concerned with why the Researcher makes one research design choice over another and the limits this places on the type and nature of data collected. Firstly though it is important to outline the role researchers’ play in shaping the research they conduct because the researcher can “shape” or “obstruct” relationships and knowledge obtained from the people being studied (Reinharz, 1997, p. 4), which means that this affects the knowledge acquired.

4.3.3.2 The role of the researcher

Researchers have a number of ‘selves’ in operation when conducting research. It can be their research based self who acts as a good listener, or a situationally created self who is a visitor to an environment, and who consequently has to learn the role the research participants play in the organisation that is being visited. The Self is therefore “...the key fieldwork tool” (Reinharz, 1997, p. 3) and it is important to understand because

“...the agency of the researcher is also being acknowledged more and more as an ideological force which impacts on relationships with people in the research setting and the way in which they are perceived” (Holliday, 2007, p. 120)

Unfortunately much “...methodological literature overlooks the variety of attributes the researchers bring to the field; similarly it minimises the wide range of selves created in the field” (Reinharz, 1997, pp. 3–4). In order to manage this criticism, the purpose of this section is to reflect on the research based selves in order to try and understand what affect these might have had on the knowledge acquired. Documenting these processes, Reinharz argues, is essential if we are to be released from the “...epistemological tension between unreflexive positivism, on the one hand, and navel gazing, on the other” (Reinharz, 1997, p. 18). A statement of experience, or what Longhofer et al (2013) call a personal statement, is offered first. The purpose of this statement is for the Researcher to reflect on how her past experiences acted as motivation for her choice of research project.

4.3.3.3 Statement of experience

This statement of experience (see Appendix 1) is what Smith and Sparkes (2008) describe as a psychosocial perspective on self and identity. Reflexivity is important in developing the life story and gives the Researcher her identity which develops over time and is sensitive to the Researcher’s psychological traits, states, and structures. This psychosocial perspective acknowledges the social aspects of the construction of the Researcher identity, but the individual is of prime importance (Smith & Sparkes, 2008, pp. 8–9).

Essential to autonomous reflexivity is a personal statement which outlines researcher values, experience, interests, beliefs and wider aims for the research. The purpose of this section is to outline how the researcher’s personal values and experiences relate to the phenomenon being studied. Holliday (2007) suggests that,

“...adding the statement of experience brings personal presence and ownership to the discussion, which may indeed strike a chord with readers who have had similar experiences, also reminding them that this is a ‘real world’ issues” (Holliday, 2007, p. 127)

The research study is concerned with the 'real world' issue of individual academic motivation and engagement in KTP projects, and whilst the Researcher has not been directly involved in a KTP herself, her experiences as a Research Assistant relate to the phenomenon being studied, as well experiences especially relating to understandings of intrinsic and extrinsic motivation.

Writing this statement of experience has been a reflective exercise for the Researcher, and "...provides a warrant for the analysis to follow" (Clifford, 1983 in DeVault, 1997, p. 219) . DeVault (1997) discusses personal writing in social research and suggests that it is autobiographical and introspective in nature, has elements of disclosure and discretion, and at times the author can vacillate between euphoria and despair (DeVault, 1997, pp. 217–219). The Researcher has written this section retrospectively and has had seven years to reflect on the experience, and so perhaps does not now experience such extremes of emotion. The hope is that this "personal storytelling" establishes "...the researcher's authority" (DeVault, 1997, p. 219) and gives access to the Researcher's reality. It is though, "subjectively personal" and cannot be validated because it is based on the Researcher's own images, interpretations and imaginations (Holliday, 2007, p. 132).

4.3.3.4 Researcher selves

Reinharz suggests that researchers create a series of selves in the field, which are the product of norms of the social setting, and which affect the knowledge obtained (Reinharz, 1997, p. 5). The researcher's presence could change the culture being investigated but if the researcher acknowledges that interacting with the culture is unavoidable but is receptive to change, they can act to become central to the analysis (Holliday, 2007, p. 138). This section considers the selves the Researcher inhabited as part of this project, and the effect these had on the culture being investigated.

4.3.3.4.1 Research based selves

This self wanted to better understand the motivations of academics who engage in university-to-business and community knowledge transfer. Motivated by her own experiences as a Research Assistant the Researcher wanted to understand if drivers for engagement were strongly reward based such as the opportunity to publish, or

whether the desire to help others and to gain new knowledge also drove engagement. She made clear in her initial invitation to academics that she herself was experienced in knowledge transfer projects, but was seeking to understand the circumstances surrounding engagement from a different perspective, in the hope that she might be able to feedback any issues and concerns, and thus improve the KTP process.

The Researcher recognised that during the interviews it was important she was a good listener who could empathise with the academics, whilst also obtaining knowledge and different perspectives on similar experiences. She used her affiliation to University of Salford as a means to access conversations with academics from similarly focused universities.

4.3.3.4.2 Brought selves

Reinharz spent a year at a Kibbutz researching the aging process of Jewish elders. She determined that at her time there she enacted twenty different selves, on set of which she categorised as “brought self” (Reinharz, 1997, p. 5). This category included her being a mother, having relatives, being a woman, being an American and being 33 years-old amongst other issues. The “brought selves” for the Researcher included being a research assistant, being a doctoral student, being female, and being 37-years old.

The Researcher had been a research assistant prior to being a doctoral student and it was partly this experience that motivated her decision to study knowledge transfer and motivation. She had experienced first hand the effects of academic motivation and ambition on knowledge transfer projects. Initially her own motivation was to understand drivers but as it transpired, barriers to motivation were as important if the processes surrounding KTP engagement were to be better aligned to university processes.

On a more personal level, the Researcher had been denied the opportunity to study for a doctorate during her role as a research assistant so now felt privileged to be in the position of being funded for doctoral study. She was impressed by the knowledge and experience of those she met, whilst also realising that as a doctoral student she was moving towards such a position herself. The Researcher was conscious that she was also younger than those she interviewed; whilst it did not appear to make a

difference it should still be regarded as another brought self.

The Researcher interviewed three females in total. Being female herself, although at the time of the interviews she was yet to become a parent, the Researcher felt she was able to empathise with some of the issues facing female academics in the workplace, particularly regarding raising a family and decisions about maternity leave taken. Other issues arose regarding how the women felt they were compared to their male counterparts, and the Researcher recognised that more female academics needed to be interviewed in order to be able to evaluate the issues more effectively.

4.3.3.4.3 Situationally created self

In all environments the Researcher was a visitor and therefore she was aware that she was representing her own university and her research supervisors. It was important to her that she acted appropriately. As a visitor she was privy to personal insights and opinions, which she anonymised as part of the analysis and writing up of the research. Having anonymity allowed research participants to speak open and honestly as far as they wished, but the Researcher recognised that as a visitor she may only have gained one insight into the issue, because as Holliday suggests, a qualitative researcher will always be a stranger (Holliday, 2007, p. 144). Despite the fact that the qualitative researcher is a stranger, the researcher still needs to reflect on their impact on the research; their presence shapes the context and provides new opportunities for the participants to reflect on their involvement in KTP activity, in ways in which they may not have reflected before.

4.3.3.5 Methodological reflexivity

Methodological reflexivity provides the researcher with the opportunity to consider how the design of the research project affected the type of data collected. Interviewing the participants as well as this reflection will be considered in relation to the creation of the project, and as these were key parts of the project design.

4.3.3.5.1 Creating project

The project was created as a consequence of the Researcher engaging in Doctoral study and wishing to answer some of her own questions about individual motivation and engagement in knowledge transfer between universities and small business. At

the end of the research project, when she was presented with the opportunity to engage in Doctoral research, she began to seek out how relationships worked when different individuals engaged in research projects. She had been given the scope to develop a project she was interested in within the context of university-business engagement, but at this stage had not sufficiently reflected on her experience as a research assistant to acknowledge that understanding individual motivation could answer some of her own questions and concerns.

Guided initially by an interest in methods for analysing academic and faculty participation in outreach activity, it was attendance on a study visit to universities in mid-West United States that prompted the question of what motivated academic engagement. It was a question which the methodologies appeared to neglect, but which the Researcher thought was important as interested and engaged academics demonstrated their commitment to projects they are engaged in. Research about knowledge transfer and individual motivation showed that much was focused on targets like publication rates, rather than individual motivation. Discussion with her KTP engaged Supervisor led to searching for relevant articles regarding KTP engagement and motivation and it was clear that this was an area of research as yet unearthed. For the Researcher there was also a degree of reassurance regarding the desire to find an original research project. Researching individual academic motivation in a KTP context presented an ideal opportunity for original research, especially when coupled it with SDT and critical realism.

The Researcher spent some time deliberating on the approaches to be used to determine individual academic motivation, but was clear that she wanted to conduct a qualitative study. This approach was representative of her previous studies and research skills, but also presented an opportunity to apply SDT in a unique way. SDT is usually positivist in its approach, favouring quantitative studies. The Researcher was keen for the responses of the participants to be properly represented and critical realism has, what Krauss (2005) calls "...a major epistemological advantage" (Krauss, 2005, p. 764) because it allows the researcher to grasp the point of view of the participants, particularly when the research represents their views in direct speech. Allowing the participants to use their own words means the researcher, participants and subsequent reader can engage in meaning making together (Krauss, 2005, p.

765).

4.3.3.5.2 Interviewing participants

Participants were interviewed at their workplaces in order that the Researcher become more knowledgeable about the context in which KTPs operate. Unfortunately the researcher did not have opportunity to visit the academics within the business environment and could be accused of not being fully immersed in the project environment. The Researcher was interested in individual academics and their motivations. As academics operate primarily within a university context, and spend only short periods of time in the business environment, it is argued that interviewing participants at their academic workplace was the most appropriate way of gaining knowledge of their reality and their perceptions of reality.

The Researcher chose to conduct semi-structured interviews because, like with the choice to conduct a qualitative study, semi-structured interviews were already part of her understanding and knowledge. Participants were asked to narrate their personal experiences, from being an academic to their engagement in KTP activity. These questions were designed to access participants' understandings of their own reality, and to use their own language to reflect on these specific areas of discussion. A semi-structured interview approach was favoured because it gave structure to the interview process, and gave the Researcher a degree of security in terms of her gaining access to what she regarded as key areas of concern. In reality the interview became more free-form because participants were key to reflect on their experiences, in particular on the less successful aspects of their engagement. The interview sessions, for some, were an opportunity to air some grievances, and this aspect of the process came as a surprise to the Researcher, but she welcomed it because it seemed a more honest account of KTP engagement.

What the Researcher had perhaps also not appreciated was that it was impossible to remain "outside of" one's subject matter (Longhofer et al., 2013, p. 141). As a novice researcher she was aware of the context in which she was operating but initially was not as "value cognizant" as a good critical realist should be (Krauss, 2005, p. 761). Value cognizant researchers are conscious of the values of human systems and the

values researchers bring to the contexts. Reflection on her practice, and a greater awareness of her own epistemological position and the effects her presence could have on the research participants and their responses to questions asked, led to a greater awareness of how the Researcher and participants could meaning make together.

Meanings, as linguistic categories, make up perceptions of reality (Krauss, 2005, p. 762) and the Researcher recognised there would be multiple perceptions about the reality of KTP engagement so chose to interview a range of participants in order to access their thoughts and words, which she represented in the data analysis with direct quotes. Like the Researcher, those committing to a realist epistemology and ontological realism

“....assert a belief that our knowledge of the world and self can be objective and that in some foundational way of sorting out trustworthy interpretations from untrustworthy ones can be established and things can be known which our words can correspond to”

(Smith & Sparkes, 2008, p. 9)

In other words the Researcher and the participants use language to establish their views, their culture, their perspectives and social reality. The critical realist does need to recognise that they will never know if or when they have accurately depicted the real world, but by directly quoting the research participants they enable to development of a new narrative.

4.4 METHODOLOGY

A research paradigm will answer the methodological question:

“How can the inquirer (would-be knower) go about finding out whatever he or she believes can be known?” (Guba & Lincoln, 1994)

As has been previously stated, this research is qualitative in nature. It uses semi-structured interviews to draw out individual perceptions of motivation, and case studies are developed in order to form a more complete understanding of motivation to engage in KTP projects.

Traditional qualitative research does tend towards constructivist or critical theorist paradigms. These are idiographic attempts to understand knowledge because they seek to find all causes of an incident. A realist, whilst not being opposed to identifying what qualities are common to a group, will look to study cases intently and put the understanding of the phenomena on a more secure footing (Harre, 1974 cited in Parker, 1994, p. 9). This allows for reflexivity and empathy, or 'verstehen', a term used by Weber to describe,

“emotional identification with the person you are trying to understand”

(Benton & Craib, 2001, p. 79)

In the axiological section above, the researcher has been reflexive and has commented on her own experiences of motivation in relation to university-to-industry knowledge transfer projects.

4.4.1 Judging the quality of critical realism research

Critical realism allows for the researcher being value-aware, rather than value-free or value-laden, and for participants to reflect on their own experiences. As the ontology particularly is more pragmatic in nature the view that,

“...all experience is to some extent shaped by our previously acquired conceptual map of the world”

(Benton & Craib, 2001, p. 30)

is supported, as is the notion that knowledge and language are acquired from our innate ability to order concepts. Positivists reject this, arguing that knowledge is acquired from experience alone. As the researcher is aware of her own impact on the research, particularly in the design of the study, and the choice of topic, she becomes more of a “passionate participant” (Lincoln, 1991, cited in Guba & Lincoln, 1994, p. 29).

The following sections will explore the research methodology in more detail. Qualitative research is first discussed, before turning to interview methods and thematic analysis.

4.4.2 Qualitative research

Realist qualitative research methodologies acknowledge the importance of the researcher as “...someone who uses their skills to unearth the evidence,” but not as “...the author of the findings” because research is a “...treasure hunt rather than a construction process” (Willig, 2009, p. 13).

Qualitative research is:

- focus on “...naturally occurring, ordinary events in natural settings” (Miles & Huberman, 1994, p. 10);
- “...an exploration, elaboration and systematization of the significance of an identified phenomenon” (Parker, 1994, p. 3);
- “...concerned with meaning...and 'what it is like' to experience particular conditions” (Willig, 2009, p. 8)

It is a data rich approach, and dependent on the process of interpretation. This research study, whilst interested in the psychological construct of motivation, is not a study in the positivist vein. It does not use control groups to test motivation, for example, but focuses on evaluating individual academic motivation when it occurs in natural working environment common to KTP projects.

The table below has synthesised descriptions of qualitative research studies, as provided by key authors in the field of research methods, and it confirms that qualitative studies are most interested in meaning making, researcher validation, the social world and the use of textual and pictorial data.

| | | Miles and Huberman (1994) | Maxwell, (2005) | Creswell (1998) | Blaikie (2010) |
|------------------------------|--------------------------|----------------------------------|------------------------|------------------------|-----------------------|
| TOWARDS UNDERSTANDING | Meanings for participant | YES | YES | YES | YES |
| | Context and effect on | | YES | | |

| | | | | | |
|---------------------------------|--------------------------------------|------------|------------|------------|------------|
| | participant behaviour | | | | |
| | Identifying unanticipated phenomenon | | YES | | |
| | Processes towards actions | YES | YES | | YES |
| | Causal explanations | YES | YES | | |
| | 'Thick' descriptions | YES | | | YES |
| | Developing concepts and theory | YES | | YES | YES |
| | Holistic view | YES | | YES | YES |
| HANDLING OF DATA | Coding of data | YES | | YES | YES |
| | Data display | YES | | | |
| | Concept mapping | YES | YES | | |
| | Inductive data handling | | | YES | YES |
| | Triangulated data | YES | YES | | |
| | Researcher validates data | YES | YES | YES | YES |
| PRACTICAL CONSIDERATIONS | Involvement in social world | YES | YES | YES | YES |
| | Flexible approach | YES | | | YES |
| | Textual and / or pictorial data | YES | YES | YES | YES |

Table 9 - Descriptions of qualitative research

As they make clear in their introductions Miles and Huberman (1994) and Maxwell (1996) are “realists” in their orientation, whilst Creswell (1998) and Blaikie (2010) follow a more interpretative epistemology. Miles and Huberman (1994) are interested in understanding “...regularities and sequences that link together phenomena” and it is from these patterns that they “...derive constructs that underlie individual and social life” (Miles and Huberman, 1994, p.4). They agree with interpretivists that subjectivity

is important but, rather than focus on meaning making, causal explanation and evidence is sought for the purposes of producing an account of the real world.

Creswell (1998) documents five types of qualitative research approaches, namely biography, phenomenological study, grounded theory, ethnography and case study. Two approaches, grounded theory and phenomenological study, were considered but rejected in favour of case studies as the qualitative approach. Before considering case studies in detail, reference is made to grounded theory and phenomenological studies in order to outline the methods used and to explain why they were not selected as approaches.

4.4.2.1 Grounded Theory

Grounded theory originated in the field of Sociology, particularly from the work of Glasser and Strauss. In 1967 they developed Grounded Theory as a method by which to develop theory from data. Variables and constructs were set aside and data was interrogated in order to discover meanings and social processes. As Glasser and Strauss suggest,

“...The goal of grounded theory is to develop an explanatory theory of basic social processes, studied in environments in which they take place”

(Glasser & Strauss, cited in Starks & Brown Trinidad, 2007, p. 1374)

Since 1967 Glasser and Strauss have parted company, and the theory has gone through a series of revisions. Detailed below is the basic process a grounded theory study might follow, as well as reflections as to why it was not used as a method in this research study.

4.4.2.1.1 The process

Starks and Brown Trinidad provide details of grounded theory and stipulate that it relies on theoretical sampling and the recruitment of participants with different experiences of the same phenomenon. Data is then collected via a mix of interviews, observations and reading around the subject. Data is interpreted, and decontextualised and recontextualised (Starks & Brown Trinidad, 2007, p. 1375). During the decontextualising process data is broken down into codes – open (in order to examine,

compare and categorise), axial (looking for relationships between data before reassembling into groups), and selective (in order to find central phenomenon). It is not unusual for grounded theory studies to comprise of 10-80 participants, because the aim is to keep visiting new participants, and obtaining new data to the point where saturation takes place.

4.4.2.1.2 Rejection of Grounded Theory

The popularity of grounded theory as a means for interrogating qualitative data meant that it was worth considering whether or not it was applicable to the research study. Also, at the beginning of the research process consideration was given to adopting constructivism as the research paradigm, and there are constructivist versions of grounded theory available. As ideas about the research paradigm developed it was decided that grounded theory would not be appropriate. From the outset, the researcher investigated studies of individual academic engagement with business and industry and, consequently, had some notions as to what might or might not be motivating. Grounded theory suggests that the researcher goes into the data collection blind, which is a different process and which has been criticised for not addressing questions of reflexivity. Secondly there are issues with reflexivity. Willig details how grounded theory has been criticised because it is, in a sense, impossible to detach the researcher from the phenomenon they are observing; a researcher has their own experiences which can not be easily left behind. Furthermore, Willig suggests that the researcher questions the data, and again it is impossible to completely leave opinions behind (Willig, 2009, p. 46). A pragmatic critical realist approach accepts the “reality” that data can be seen as is, but also is accepting of the researcher as a “passionate participant” and likely to have an impact on the data. Consequently the grounded theory approach does not suit a pragmatic critical realism.

4.4.2.2 Phenomenological Studies

Phenomenological studies involve the use of “thick descriptions and close analysis” (Starks & Brown Trinidad, 2007, p. 1373) to understand lived experiences. One particular form of phenomenological study was considered at the outset of the study. Interpretative Phenomenological Analysis (IPA), rather than presuming it possible to get full access to the lived experience, realises that it will only ever be an interpretation. IPA is a version of phenomenological analysis which has also gained popularity

because, as Willig suggests, it has a systematic analytic procedure and detailed descriptions of the analytic process.

4.4.2.2.1 The process

Like grounded theory IPA studies gather data from interviews. In the case of IPA the interviewer allows the participant to talk about a subject, then asks probing questions. With regards data analysis IPA follows a similar procedure to grounded theory. The focus is on interpreting, decontextualising and recontextualising. The first stage of the analysis is conducted as a read through of the data, and then a noting of initial thoughts. The second stage is more focused, and themes are identified and labelled. These themes might be conceptual at this stage. The third stage introduces structure into the analysis and looks for connections between themes, and the fourth stage includes producing a summary table of the themes, with codes and example quotations.

4.4.2.2.2 Rejection of Phenomenological Studies

Whilst IPA was initially appealing to the researcher because of its use of systematic procedures, there was again the issue of researcher a priori knowledge and research in the area of knowledge transfer and university business engagements. IPA guidelines seek to 'bracket' a priori knowledge, and this knowledge is only integrated towards the end of the individual analysis, which meant it ran counter to the process that the researcher had been using.

4.5 RESEARCH DESIGN

The following section provides a narrative documenting how research design is applied to this research study of individual academic motivation in the context of KTP projects.

4.5.1 Case studies

The use of case studies is an appropriate approach because:

- a “concrete” (Yin, 2009, p.33) and “...fairly well-circumscribed and captive group” (Brewerton & Millward, 2001, p. 53);
- “the description of an ongoing event in relation to a particular outcome of interest over a fixed-time in the 'here-and-now” (Brewerton and Millward, 2001, p.53);

and,

- when there need be no control over behavioural events (Yin, 2009);
- where “...the boundaries between phenomenon and context are not clearly evident” (Yin, 2009, p.18)
- in depth examination of data is required (Breweton and Millward, 2001, p.53)

The group has definite boundaries because all participants have been involved in KTP activity. Involvement in KTP activity is recent; either ongoing or just recently completed. It is not possible to expect to, or to control the participants' behaviour and reactions to events, because the activity takes place in naturally occurring environments rather than in laboratory conditions. Contextual conditions are important and it is recognised they could have an impact on individual motivation.

4.5.1.1 Applicability of case study research to critical realism

In the research study case studies such as this, which focus on individuals' thoughts and feelings, are realist in orientation. It is accepted that it is possible to gain access to an understanding an individuals' world from their accounts of their world. It is also suggested that case study research tends to focus on contemporary issues, as well as issues where the relationships between behaviours have not been adequately established (Perry, 1998, p. 787). This is the case in this research study because motivation, and particularly SDT, has not been applied to KTP engagements.

Case studies also take an idiographic approach, focusing on the particular, and move cautiously to engage with theory development or generalisation. They are compatible with critical theory because each case is unique, even when it shares some similarities with cases around it and in addition because the world is seen as a complex place there is no predictability in terms of behaviour (Willig, 2009, p. 87). Furthermore, such case studies suit critical realism because the cases operate within the realm of the social world and it is accepted that the environment, people, politics, and culture will have an impact on findings and behaviour.

4.5.1.2 Case study design and selection

A number of considerations need to be made in terms of case study design. The aim in the following sections is to show how these relate to the research study.

4.5.1.2.1 Single versus multiple case design

Yin (2009) asserts that there are four decisions to be made in terms of case study design. These relate to whether the researcher is interested in single or multiple case studies, or holistic or embedded studies. There are, according to Yin, four types of case study design namely:

- *single holistic;*
- *single embedded;*
- *multiple holistic; and,*
- *multiple embedded.*

4.5.1.2.2 Single versus multiple

Obviously, a single case study refers to a study of either one individual or one particular project, and multiple refers to studies of a number of individuals or a number of projects, which can be similar or different in type. One of the main issues with a single case study is that at the beginning one phenomena might be under investigation but over the course of time the shift in focus changes and the case study needs re-formulating. This is addressed by having a clear operational definition and a defined unit of analysis. Single case studies tend to be intrinsic in design, and suitable if they represent a critical case in testing a well-formulated theory, or are extreme or unusual cases. Yin (2009) suggests using a single case when it is representative of a situation, when it is revelatory, or when it is a longitudinal study. In the case of the research study a specific theory, SDT, is a well formulated theory but has not been applied to understanding KTPs and individual academic engagement. It therefore lacks a conceptual framework. It could be explored in terms of a single case study because it represents, "...an opportunity to test the applicability of existing theories to real-world data" (Willig, 2009, p. 78), and as Yin suggests,

"A single case, meeting all the conditions for testing the theory, can confirm, challenge, or extend the theory" (Yin, 2009, p. 47)

In contrast multiple case study design provides the opportunity to study a phenomenon of interest (for example, motivation) and to compare case studies, in order to determine

a conceptual framework which accounts for all instances of the phenomena. According to Perry (1998) it is useful for theory generation and theory development, and suited to realism research when constructs are not available, or are inadequate. After the pilot study, SDT was identified as an interesting approach to the study of motivation, and for understanding how individual academic motivation might affect engagement in KTP projects. Whilst it is a well-established, well-tested theory, it has not been tested with regards to KTPs, and therefore lacks a conceptual framework. This research study adopts a critical realist position, and a multiple case design provides an opportunity to consider a phenomenon as lived by individuals, but also takes into consideration the social, cultural, organisational culture as its context.

4.5.1.2.3 Holistic versus embedded

Yin (2009) discusses case studies in terms of being *holistic* or *embedded*. Holistic refers to there being a single unit of analysis whilst embedded refers to there being multiple units of analysis. Rowley (2002) suggests that a holistic study might consider broad issues such as organisational culture or strategy, whereas an embedded approach would look at sub-units of analysis such as meetings, roles, and locations. She considers case study methodology in relation to management research and her findings therefore have a degree of applicability to the research study.

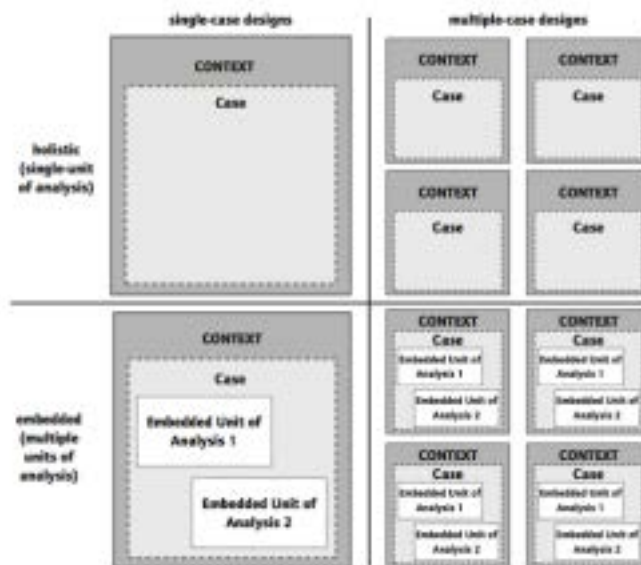


Figure 2.4 Basic Types of Designs for Case Studies
SOURCE: COSMOS Corporation.

Figure 12 – Holistic and embedded case study design

In the case of this research study it had to be decided whether KTPs or the individual academic would be the unit of analysis. It was decided that each academic would be treated as an individual case. Consideration of HEI environments and KTPs as knowledge transfer programmes would be contexts, and the university and KTP project would act as a work context.

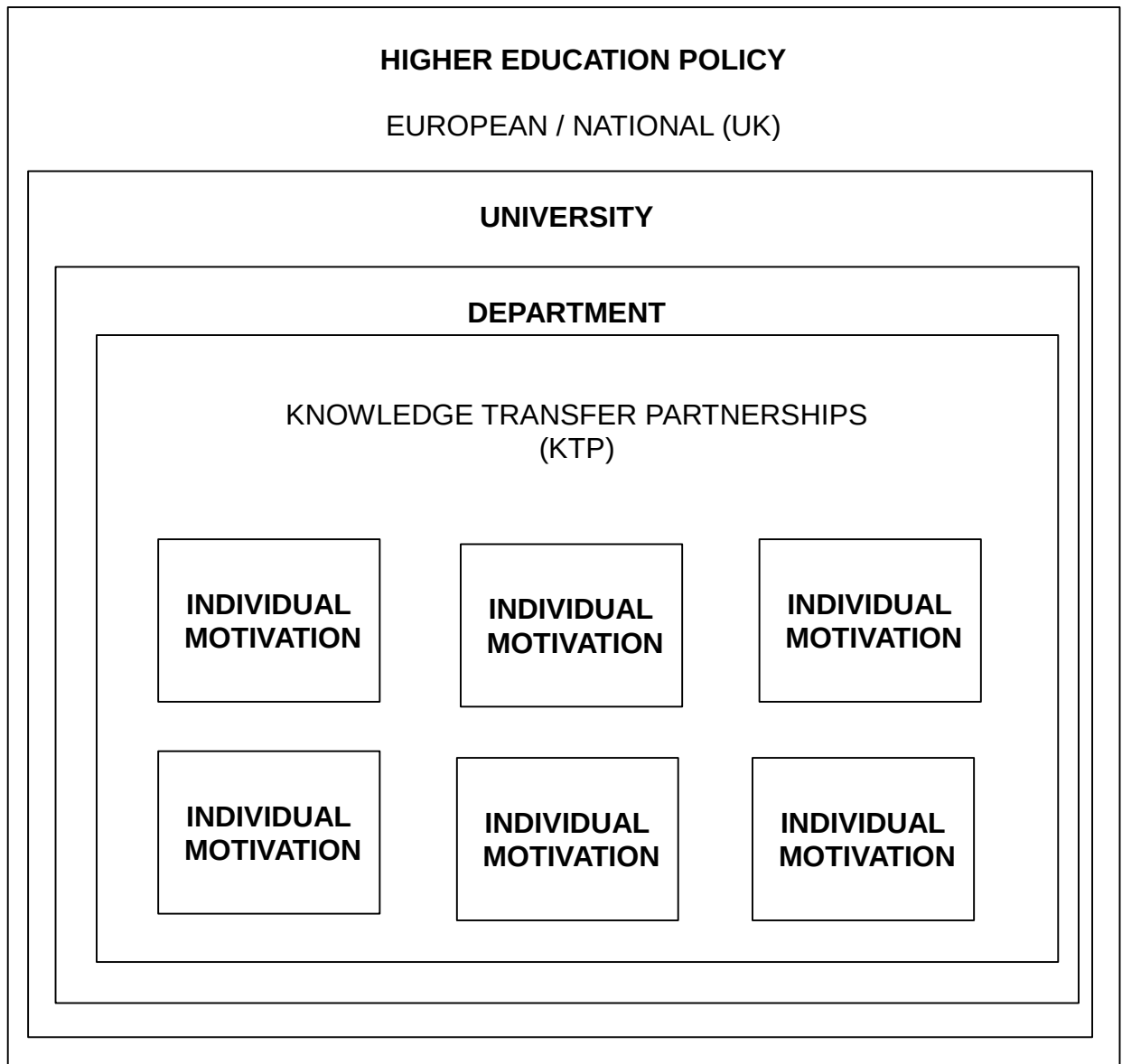


Figure 13 - Individual case studies embedded into research design

4.5.1.2.4 Intrinsic versus instrumental case design

Stake (1978; 1994) defined cases in terms of being *intrinsic* or *instrumental*. For this research study it is difficult to differentiate between intrinsic and instrumental because both of these types were appropriate. The adoption of a more pragmatic approach makes it possible to accommodate such differences of opinion, and Stake himself said,

“Authors and reports seldom fit into such categories, and I see these three

[intrinsic, instrumental, and collective] as heuristic more than functional”

(Stake, 1994, p. 238)

In terms of intrinsic cases, Willig (2009) provides an example of a researcher who was interested in patients with rare diseases. The intrinsic interest is in the disease; this issue is pre-fixed, and unchanging despite other circumstances. In terms of this research study individual motivation to engage in KTPs is interesting in its own right, and not necessarily a general phenomenon.

Instrumental cases are, as Willig suggests, exemplars of more general phenomenon and focus on how individuals experience the phenomenon. Motivation is an example of a phenomenon and, according to Willig individuals constitute suitable cases for analysis. To all intents and purposes, then, this research study looks at instrumental studies that demonstrate how individuals experience the phenomenon of motivation. Multiple cases, rather than single cases, tend to be instrumental and tend to be used to formulate hypotheses.

4.5.1.2.5 Descriptive versus explanatory

Case studies can also be described in terms of whether they are focused on description or focused on providing an explanation. Descriptive case studies do not incorporate existing theory but, rather, they hope that new insights will be generated in order to explain what has occurred. Explanatory case studies, whilst also describing what has occurred, look to also explain and use explanatory concepts to aid the process. In the case of this research study, the aim is to create explanatory case studies which use pre-existing theory to help explain what has occurred, and also to challenge and develop theory.

4.5.1.2.6 Replication logic

Finding examples of the same phenomenon across multiple individuals increases the potential for generalisation (Firestone, Herriott, & Wilson, 1984). Multiple cases also make data and evaluations more compelling and robust because they can follow a form of replication logic which increases the external validity or objectivity of the study.

Yin (2009) describes this replication as either being *literal* or *theoretical*.

- *Literal replication* refers to the ability to predict similar results, and;
- *Theoretical replication* means that different results can be predicted but for understandable reasons.

Yin suggests that there should be two or three cases where similar results can be predicted, and a greater number where different results are predicted, and perhaps different patterns of theoretical replication. If it is found that the cases support the initial propositions, then there is a compelling argument for validity. If the cases are contradictory, for example suggestive of something else other than autonomous motivation being an important driver of engagement, then the propositions will need revising and retesting with new cases.

Yin suggests that a framework is needed to document the conditions in which literal and theoretical replication will occur. With regards this case study the following applies:

| LITERAL REPLICATION | THEORETICAL REPLICATION |
|---|---|
| Controlling environment thwarts internalisation and intrinsic motivation (IM) | Autonomy-supportive environment facilitates internalisation and promotes intrinsic motivation (IM) |
| Not feeling related will mean development and well-being are negatively affected | Feeling related is important for optimal development and well-being |
| Where environments are not mastered intrinsic motivation (IM) will not be strong and feelings of competency will be low | Feelings of competency are yielded when intrinsic motivation (IM) is at its strongest because environments have been mastered |

Table 10 - Framework for replication logic

The above framework is a means by which it is possible to identify appropriate case studies that match with either literal or theoretical replication logic. The propositions

relate to SDT. SDT proposes that the basic needs for autonomy, competence, and relatedness are important if a person is to behave positively, to master their environment, to perform effectively, and to experience satisfaction. These needs are important if an individual is to be intrinsically motivated and experience the most autonomous form of extrinsic motivation. Both of these may be necessary to the success of KTP projects and partner relationships.

4.5.1.2.7 Ensuring objectivity

It is recognised that one of the main challenges of using the case study approach is to ensure objectivity. Case studies have been criticised because there is a fear that evidence cannot be generalised beyond the local circumstances of the case, and it has been argued that the impact of the case studies cannot be determined because they are not often systematically controlled (Brewerton and Millward, 2001, p.53-4). Validity should, therefore, be based on significance to the public, and the completeness of the study.

Yin (2009) designed four tactics which attempt to address challenges to objectivity. The table below is based on Yin's (2009) explanations with potential challenges to objectivity added in an additional section:

| Challenges | Tests | Case Study Tactic | Phase of research in which tactic occurs |
|---|-----------------------|---|--|
| Lack of sufficient evidence to confirm claims | CONSTRUCT VALIDITY | Use multiple sources of evidence | Data collection |
| Evidence does not match to findings | | Establish chain of evidence | Data collection |
| Informants views are not sufficiently or correctly reported | | Have key informants review draft case study reporting | Composition |

| | | | |
|--|-------------------|--|-----------------|
| Lack of consideration of alternative perspectives | INTERNAL VALIDITY | Address rival explanations | Data analysis |
| Lack of consideration of causal relationships between factors | | Do explanation building | Data analysis |
| The evidence from the study can not be generalised to a wider (similar) population | EXTERNAL VALIDITY | Use replication logic in multiple-case studies | Research design |
| Lack of systematic control at time of data collection | RELIABILITY | Use case study protocol Develop case study database | Data collection |

Table 11 - Challenges to case study design and tactics to overcome (Adapted from Yin, 2009, p.41)

4.5.1.2.8 Reliability

All attempts are made to systematically control the data. These are as follows:

- Case study database – contains contact details for participants. Secure, password protected file;
- Case study protocol (Yin, 2009) (see Appendices 1&2) – overview (including purpose and aim and objectives; list of participants and contact details; copy of interview schedule; letter of introduction; and, outline of the research report (see Data Analysis chapter).

4.5.1.2.9 Construct validity

In order to make the evaluation as reliable as possible, based on the evidence provided, multiple sources of evidence are needed, and the collection of which needs to be easily understood, and the view of the participants need to be correctly reported. This will improve construct validity and is achieved in the following ways:

1. After the interview participants are asked to confirm the transcript. The final case study reporting is to be shared with selected participants;
2. Where possible documentary evidence, such as supporting documents, publicity, and the KTP application, is collected from the KTO. This begins to form a chain of evidence and helps address claims made as well as issues concerning participants who may be unwilling or unable to vocalise their opinions during the interview;
3. Some participants were revisited and asked to reflect on the interview process and the evaluations of their motivation. This short interview provides additional data to corroborate findings and also helps in the development of theory;
4. To overcome issues of incorrect representation by the researcher or misinterpretation of data, the variety of data sources will be triangulated to improve confidence;
5. Maintaining a chain of evidence, including the protocol and database and multiple sources of triangulated evidence, with evaluations confirmed by the participants, should improve the overall quality of the study.

4.5.1.2.10 Internal validity

Addressing rival explanations and explanation-building at the stage of data analysis should improve the internal validity of the study. This will be achieved in the following ways:

- The principles of SDT are applied to evaluating the data derived from the interviews. There will be therefore some consideration of how basic psychological needs - autonomy, competence, and relatedness - are met. When analysing the data however it might be apparent that autonomy, competence, and relatedness are not the most important means by which to achieve psychological well-being in KTP environments. Thus, when discussing the working environment, the social and emotional context and the policy and

project environments, there could be other ways of achieving intrinsic and extrinsic motivation. The purpose is to create as rich a picture as possible, and to ensure all perspectives are considered.

- An iterative process of explanation building occurs at the stage of data analysis. Initial propositions, listed below, are tested against one case then retested against others until a theoretical statement or proposition is developed which best fits the data set. This is a hybrid approach with a priori research used to deduce both the interview questions and theories to be tested, and then the new data can be used to develop propositions and theoretical statements.

For this research study the initial theoretical statements or propositions are based on a priori research findings and SDT theory:

- where an environment is supportive individuals feel autonomous and self regulated, and intrinsic motivation is promoted. Conversely, where an environment is controlling, the value is internalised but it is used to measure self worth;
- academics self-select projects which they think will be successful, and that academics will enjoy the autonomy to set their own goals and targets. Where choice is provided, intrinsic motivation will be increased;
- academics will be intrinsically motivated by the opportunities to gain and apply new knowledge, and, when they feel they have mastery over their environment, their feelings of competency will be enhanced leading them to be intrinsically motivated
- academics find support from their Department and university administration extrinsically motivating when they have autonomy in their actions. This feeling of autonomy satisfies basic psychological needs, and leads to more effective performance;

- prior experience is an indicator of the propensity for an academic to engage in collaborations with industry because they feel a sense of relatedness to the participants. Feeling related is important for psychological well-being, promotes internalisation, and enables the individuals to experience more autonomous (intrinsic and integrated extrinsic) motivation;
- academics will pursue activity for the purposes of research commercialisation and academic output and this will be extrinsically rewarding and have a positive effect on performance, so long as the environment is not felt to be controlling. If given, rewards that are kept non-salient and unexpected will have no affect on intrinsic motivation and positive feedback will enhance intrinsic motivation.

The relationship between SDT theory and a priori research findings are illustrated in Figure 13. This diagram explores where a priori research findings feature within the Motivation Continuum (Gagne & Deci, 2005). This diagram will be explored in more detail in the data analysis and discussion sections which follow.

4.5.1.3 Pilot study

The pilot study took place between February and March 2009 and four participants were interviewed. It was used to assess how appropriate the interview schedule was for the research study. Two main learning points came from the pilot study:

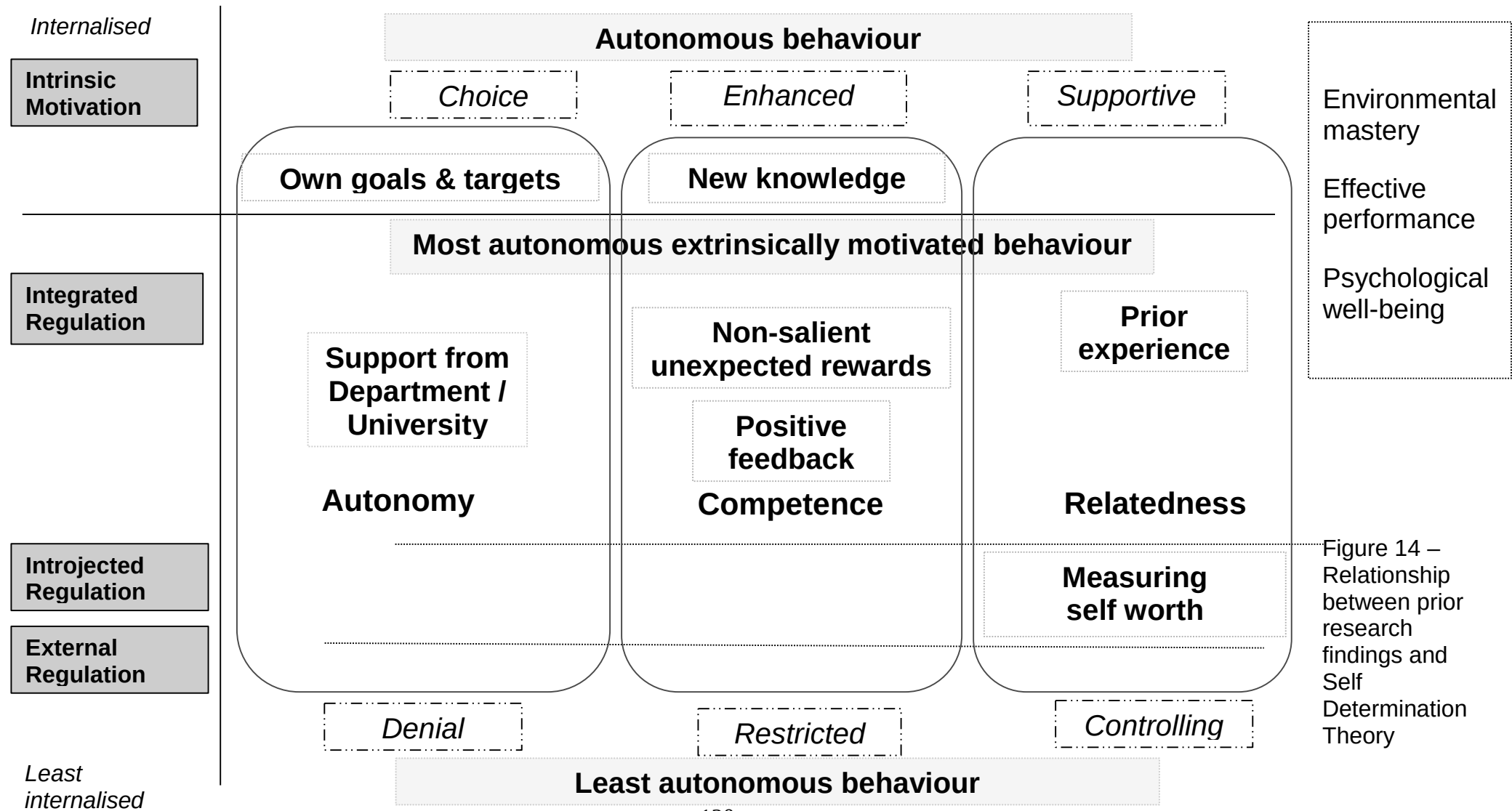
- there should be less direction and guidance from the researcher. The participant should be allowed greater expression of their opinions, feelings, etc.;
- the process by which academics engage in KTP activity can be challenging and de-motivating ;

The implications of the first findings were that more flexibility was provided to ensure that the participants had the opportunity to express their feelings and opinions. This did not require a change to the interview schedule but a change in the interview style of the researcher. Rather than offering comments when the participant went quiet the research held back and allowed the interviewee a period of reflection. Inevitably the participant returned to the thread of the conversation and contributed additional

opinions.

The second learning point suggested that more time had to be given to reflecting on de-motivators and how these affected intrinsic, as well as more autonomous forms of extrinsic motivation. Furthermore, it meant there was a need for a greater analysis of de-motivators within the data analysis process, and consequently a consideration of how these might be integrated into a motivation continuum, as per Figure 5.

The same interview schedule was used for the main study because pilot study participants responded favourably to the questions. Indeed, in some cases, they appreciated a change from structured interviews to an interview schedule which included card sort exercises.



4.5.1.3.1 Selection of participants

Once the pilot study was completed the main study was conducted. In total fifteen individual academics were interviewed (which includes the four pilot study participants), details of which can be found in Appendix 2 - Case Study Protocol. For the purposes of comparison, only academics at universities in England were selected for interview.

In order to find participants for the research study a targeted email was sent to Knowledge Transfer Offices (KTO) at universities in North West and South East England. Both the North West and South East of England have high concentrations of universities and it was felt that there would be an opportunity to get a reasonable sample size. The email requested that academics involved in KTP projects be asked if they were willing to participate in this study. This approach did have its limitations, namely that either emails did not reach the correct individuals or there were no replies from some institutions. This means that the findings are likely skewed and relevant only to the specific universities where the academics are employed. The findings, therefore, could be criticised for being insufficiently replicable across a broad spectrum of universities.

In hindsight it might have been more appropriate to use a snowballing strategy. Here an individual would recommend other suitable academics involved in KTP activity. The snowballing strategy worked later in the interview process when a contact made at a conference recommended herself and other colleagues, as willing to be interviewed. It worked well in this instance, but if the snowballing strategy had been applied elsewhere other individuals might have been unwilling, or unable, to find additional participants, and this could have jeopardized the research study.

The individuals who responded to the email (and they tended to come from newer universities) were, in the majority of cases, male and held posts in the fields of management (construction and business), health sciences and engineering. This is the most likely outcome because KTPs are designed to focus on connecting science,

technology, engineering and management subjects (STEM) to business and industry, and rarely are arts subjects suitable for KTP projects. The data and conclusions drawn from this group could question the external validity of the resulting theory being tested and developed, and so, in order to corroborate findings, there may need to be further studies using a different group of individuals. This limitation could have been addressed by following a more targeted approach and identifying appropriate interview candidates. If additional studies were to be carried out, this would be the participant selection process that would be used.

4.5.1.4 Interviews

Interviews were used to gather data from the participants in the research study, and, as such, encouraged the researcher and participant to discuss the phenomenon under investigation. These interviews provided a flexible approach and were compatible with a range of methods of data analysis, including thematic analysis and thus were deemed appropriate.

The interview questionnaire (see Appendix 2 - Case Study Protocol) is semi-structured and gives interviewees the opportunity to explore their individual motivation for involvement in KTPs. Semi-structured interview schedules ensure that the interviewees are asked the same type of questions. Within this framework the interviewee is also able to explore a broader range of issues; these issues might be more relevant than first assumed and therefore worthy of further investigation.

| Type of interview questions | | |
|-----------------------------|---|---|
| Structured | Questionnaire with directed questions | Researcher is in complete control of the questioning. "Private definitions" (Merton and Kendall, 1946, p.546) are rarely forthcoming. |
| Semi-structured | Some structure to the question schedule | Researcher uses some questions to control the content of the interview but responses from the interviewee to dictate different directions are |

| | | |
|---------------------|--|---|
| | | encouraged. |
| Unstructured | No structured questions. Akin to a conversation | Researcher has some general areas of interest to discuss. What is discussed is dependent on responses from the interviewee. |

Table 12 - Types of interview questions (adapted from Merton and Kendall, 1946; cited in Merton, Lowenthal, & Kendall, 1990)

The interview was semi-structured but also it was a “focused interview” (Merton and Kendall, 1946, p.541, cited in Merton et al., 1990). A focused interview meets the following criteria:

- The participants should have experienced a particular research phenomenon;
- The researcher will have conducted a review of a priori research to arrive at a set of research questions (or hypotheses) worthy of further investigation;
- The researcher will have developed an interview guide which is designed to locate responses to the research questions (or hypotheses);
- The interview will be focused on subjective experiences which will enable the researcher to either validate the research questions (or hypotheses) or falsify the research questions (or hypotheses) due to new, unanticipated data

The interviews should provide the interviewee with the opportunity to express their beliefs and ideas about the research phenomenon in question, which in this case is individual academic motivation in the context of KTPs. For this research study the participants were selected because of their current involvement in KTP activity and the interview questions were developed from a priori research. Using this deductively to develop a set of research questions, but having the flexibility and opportunity to use the interview data inductively to test and develop new theory, ensured that semi-structured focused interviews are compatible with the research paradigm of critical realism. Furthermore, by keeping guidance to a minimum, and encouraging the interviewees to fully explore their personal context, it is proposed that the researcher can elicit “significant data” (Merton and Kendall, 1946, p.545). This “significant data” is

then analysed and reflected upon by the researcher.

4.5.1.4.1 Likert Scale

A Likert Scale was designed as an additional means by which to elicit data from the participants. A review of the literature provided a series of over twenty words (see Table 12 below) applicable to academic engagement in KTPs, which participants were asked to rank, from strongly agree to strongly disagree.

| | | | | |
|-------------|---------------|----------------|----------------|-------------------|
| Proficient | Versatile | Empowering | Unconventional | Self-motivated |
| Amenable | Co-operative | Enthusiastic | Spontaneous | Competent |
| Dedicated | Skilled | Sociable | Detached | Analytical |
| Creative | Philanthropic | Procrastinator | Committed | Confident |
| Independent | Energetic | Altruistic | Supportive | Strong work ethic |
| Decisive | Driven | Appreciative | Tenacious | Organised |
| Dominant | Self-assured | Responsible | Determined | Nurturing |
| Ethical | Influential | Critical | | |

Table 13 - Likert Scale - qualities of engaged academics

The words represented “qualities” it was thought that academics engaging in KTP activity, might, or might not, demonstrate. The

“...statements should be worked to reflect both positive and negative attitudes towards the issue” (Kumar, 2005, p. 147)

and it is assumed that each statement is of equal “attitudinal value” (Kumar, 2005, p. 145). It is difficult though, or near impossible, to ensure each statement has equal importance and, rather than measuring attitudes, the scale merely ranks individuals according to how intensely they feel toward the issues being discussed. These are the

limitations of using Likert Scales, according to Kumar (2005), but they were not specific issues in this study. Overall it was felt that the Likert Scale needed refining, and could be better used if more careful consideration was given to appropriate concepts. The process of developing Likert Scales was unfamiliar to the researcher and, whilst the data was interesting, it was felt it needed much more development and clear understanding if it was to be used as a credible tool for data collection.

4.5.1.4.2 Card sort

Along with the Likert Scale exercise the participants were also presented with a Card Sort which was intended to enable them to reflect upon their experience of engagement in recent KTP activity. They were presented with the following words to choose from

| | | |
|-------------------------------------|------------------------|-------------|
| Novel | Complex | Habitual |
| Intense | Uncertain | Satisfying |
| Variety | Enjoyable | Challenging |
| Connection to teaching and learning | Connection to research | Competitive |

Table 14 - Card sort – available choice of words

These words were placed onto separate pieces of card and the academics were instructed to use the cards provided to create their “story” of engagement in a KTP project. They were set no limitations on which cards to use, whether all or some cards had to be selected, or how to place the words. This open card sort adapts the traditional approach because there is no direct requirement for categorisation. Instead the interviewee, as they relate their story, forms their own categories such as “At the beginning...” or “Once the project was established...” Extra questioning helped validate the data received from the sort, and provided a means by which the researcher could obtain a window onto the participant's view of the world. Photographs were taken of the responses to the exercise and will be included in the data analysis where relevant.

Card sorts are a process for categorising a set of data. They are popular as a method of assessing how a person structures knowledge (Harper et al., 2003) and, particularly with persons suffering from head injuries, is a well-established method in psychology (Gerrard & Dickinson, 2005, p109; cited in Fincher & Tenenberg, 2005). Traditionally, an interviewee is presented with a set of cards which display a word, object or picture. They are then asked to either (a) determine their own categorisation for the data (which is an open sort) or (b) to categorise a set of cards according to a set of categories determined by the interviewer (a closed sort) (Rugg & McGeorge, 1997, p81). There are different types of sorts including Q-sorts, hierarchical sorts, repeated single-criterion sorts and “all in one sorts” (for further discussion see Rugg & McGeorge, 1997). The literature suggests that card sorts are fun, quick and relatively easy to administer (Cataldo, Johnson, Kellstedt, & Milbrath, 1970, p205,) and (Rugg & McGeorge, 1997, p81). Overall this process worked better than the Likert Scale, because it was less affected by imbalances between researcher and participant interpretations of wording.

4.5.1.5 Case study analysis

Once the interview data was collected it had to be analysed in order for theory to be developed. This is the final layer of the Research Onion. The case study analysis process considers the most internal layer, individual motivation, and relates it to knowledge and partnerships. Figure 14 is provided below to act as a reminder, but individual motivation is highlighted to reinforce that that is the focus area.

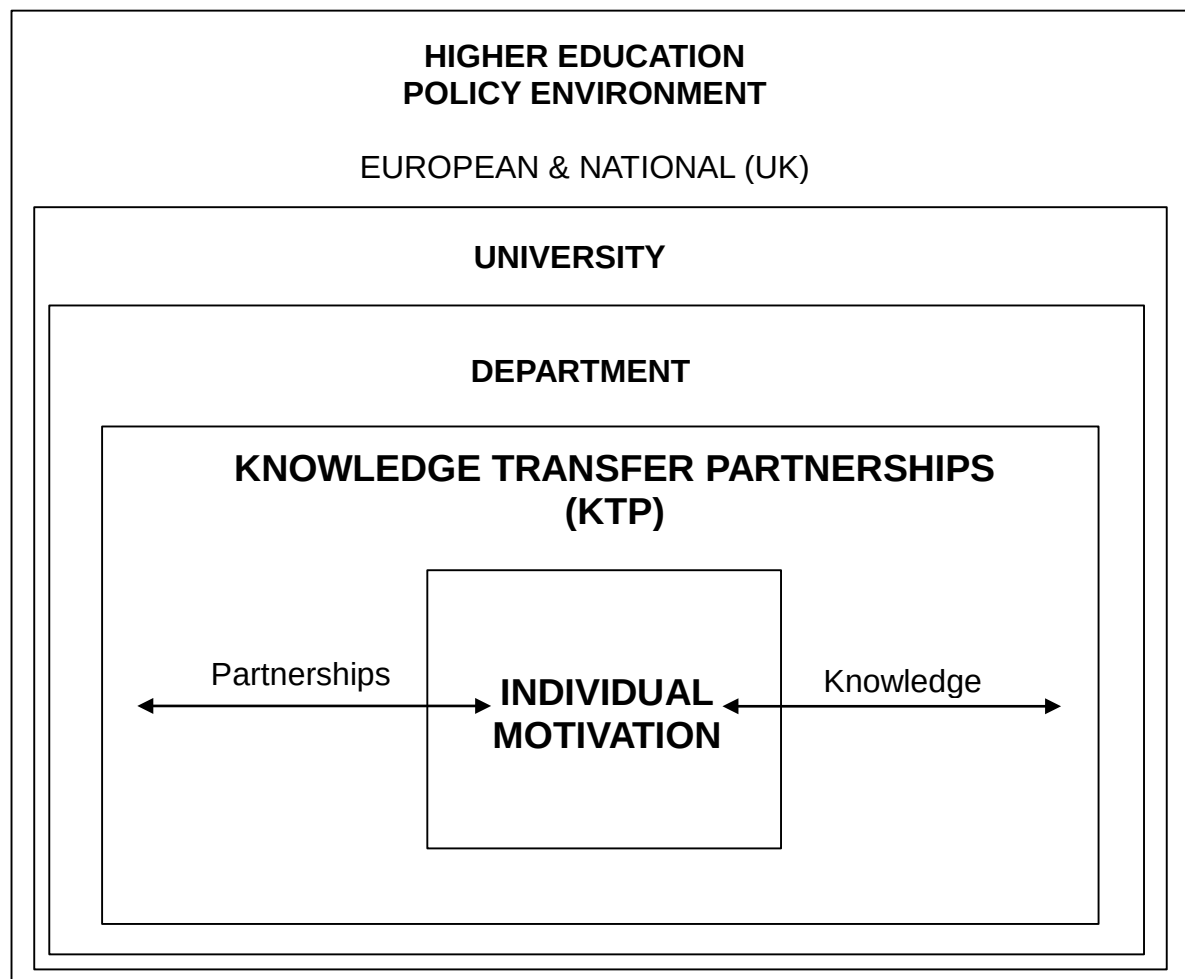


Figure 15 - Relationship between concepts, showing embedded individual case studies

Two approaches were used in the case study analysis process. For each individual interview an analysis was conducted in order to determine key concepts occurring in the interview data. Once individual analyses were complete a cross case analysis was conducted which synthesised themes from the individual interviews into a master list of themes. These were then reported upon in the Data Analysis chapter. This is a reflexive approach, allowing the researcher to empathise with the interview participants. A pragmatic critical realism approach means that whilst having an awareness of the participants, the possibility of being able to reflect on the reality of each case presents itself. The following section describes the process of the individual and cross case analyses.

4.5.1.6 Thematic analysis

Thematic analysis, whilst not bounded by epistemology according to Braun and Clarke (2006), does tend to be either a realist or constructionist method, which for this study works well with the research philosophy of pragmatic critical realism. For Braun and Clarke it is a contextualist method, a means by which the researcher can reflect both on the individual experiences of the academic and on the context in which the academic collaborates as part of the KTP activity.

Thematic analysis is common to many forms of qualitative analysis and is focused on the identification, analysis and reporting of themes. When ascertaining a set of guidelines to aid the process, two forms of thematic analysis were identified, namely an approach by Braun and Clarke (2006), which is used in this study, and an alternative, more positivist approach by Boyatzis (1998). The following sections will explain how Braun and Clarke's six step approach is used in this research study. Examples from an interview with an academic involved in Knowledge Transfer Partnership activity will be used to form a narrative.

The participant interviewed is female, is employed by a North West university and works in the Business Management department, both as a Researcher and Senior Lecturer. A copy of the full coded transcript is available on request.

4.5.1.6.1 Familiarise self with data

The first stage is for the researcher to familiarise them self with the interview data. The researcher conducts both the interview and the analysis of the data. This is advantageous because the researcher is able to visualise the interview taking place, and can remember gestures which the recording does not pick up. However it can also mean that the researcher neglects to re-read the transcript properly, because they feel they already know the data. A balance therefore needs to be found.

During the read-through of the interview the researcher needs to consider how the data could be coded. This will form initial codes. The following excerpt shows initial codes

generated from the data:

| Stage 1 | | Stage 2 | |
|---|--|--------------------------|------|
| INITIAL CODE / IDEAS | TRANSCRIPT | INTRINSIC / EXTRINSIC | CODE |
| | <i>I'm interested in academics engaging in enterprising activity. First of all I wanted to ask you your story of how you became an academic.</i> | | |
| <p>By chance</p> <p>Disappointment</p> <p>Link between education & Training in business</p> <p>Awareness of need to improve knowledge</p> <p>Action to improve knowledge</p> <p>Job prospects dictated doing PhD Not done for love of knowledge ? But wouldn't have done it if didn't</p> | <p>Erm, my background is in retailing and I've had always worked in retailing and I never thought about being an academic if I'm honest. I then moved in FE when my son was one because I thought it would mean really long holidays but it didn't. Then I quite liked that side of it and I'd been a Training and Development Manager so it kind of links. But then I got caught up in "oh I should be reading harder stuff." I then looked into going into HE and I went and did a Masters in HE. In HE I needed a Masters qualification and I went to Salford. Part-time in Management Studies and at that time that was enough to get into University. And then when I moved into HE I decided, for whatever strange reason, I'd do a Ph.D. It was serendipity really, as opposed to</p> | | |

| | | | |
|----------------|---|--|--|
| want to learn. | planned. It emerged as an alternative to doing anything else. | | |
| | <i>So what do you like about academia? What has kept you here?</i> | | |

Table 15 - Excerpt 1- Initial codes

The excerpt shows that personal circumstances to some degree motivated the participant's move into academia. She was extrinsically motivated by the prospect of a working environment which accommodated the needs of her family and was disappointed when these needs were not met.

Once she was working in academia she began to see links between her previous roles and what she was now teaching, and then became more aware that her knowledge needed improving. In this respect she became more intrinsically motivated by the knowledge and competencies she was gaining to such an extent that she completed a Masters and Doctorate. But this action was also, to a degree, extrinsically motivated because she recognised that without the higher level qualifications she would be unable to improve her job prospects.

4.5.1.6.2 Generate initial codes

Thematic analysis can take place at either a semantic (explicit) level or a latent (interpretative) level (Boyatzis, 1998 in Braun and Clarke, 2006, p.84). The semantic level is most suitable for a critical realist approach and is concerned with establishing the process and structures which impact on experience, rather than evaluating the language used to describe experiences, which is typical of more interpretative approaches. This is because "...a simple, largely unidirectional relationship is assumed between meaning and experience and language;" the consequence of which is that it is possible to "...theorise motivations, experience and meaning in a straightforward way" (Braun and Clarke, 2006, p.85).

The second stage is therefore to look for semantic content, which is driven by theory.

Theoretically driven thematic analysis can have its limitations and means that the data provides a "...less rich description of the data overall, and a more detailed analysis of some aspect of the data" (Braun and Clarke, 2006. p.84). This limitation is accepted because the nature of the research study has been to use theory to drive the research questions and the interview schedule, but, in order to improve internal validity, rival explanations will be examined, and to improve the construct validity, any claims will be triangulated with additional evidence.

At this stage the objective is to code for as many themes as possible, and to ensure that some surrounding data is included in order to provide a context. It is also possible that some data might be relevant to multiple themes. The following excerpt illustrates this approach:

| Stage 1 | TRANSCRIPT | Stage 2 | |
|----------------|---|---------------------------|------------------------------|
| | | INTRINSIC / EXTRINSIC | CODE |
| | <i>I'm interested in academics engaging in enterprising activity. First of all I wanted to ask you your story of how you became an academic.</i> | | |
| By chance | Erm, my background is in retailing and I've had always worked in retailing and I never thought about being an academic if I'm honest. I then moved in FE when my son was one because I thought it would mean really long holidays but it didn't. Then I quite | Amotivated | Not part of career plan |
| Disappointment | | Identified Regulation (E) | Personal circumstances |
| Link between | | Intrinsic Motivation | Knowledge crosses boundaries |

| | | | |
|---|---|----------------------------|--|
| education & Training in business | liked that side of it and I'd been a Training and Development Manager so it kind of | | Improving knowledge |
| Awareness of need to improve knowledge | links. But then I got caught up in "oh I should be reading harder stuff." I then | Intrinsic Motivation | Increasing competency |
| Action to improve knowledge | looked into going into HE and I went and did a Masters in HE. In HE I needed a Masters qualification and I went to Salford. | Identified Regulation (E) | |
| Job prospects dictated doing PhD? Not done for love of knowledge ? But wouldn't have done it if didn't want to learn. | Part-time in Management Studies and at that time that was enough to get into University. And then when I moved into HE I decided, for whatever strange reason, I'd do a PhD. It was serendipity really, as opposed to planned. It emerged as an alternative to doing anything else. | External Regulation (E) | Improving career prospects – pressure? |
| | | Introjected Regulation (E) | Avoidance of other tasks |
| | <i>So what do you like about academia?</i> <i>What has kept you here?</i> | | |

Table 16 - Excerpt 2: Generate initial codes

Excerpt 2 illustrates the second stage in the process of thematic analysis. This is a theoretically driven thematic analysis so it was important to acknowledge previous attempts by Gagne and Deci (2005) to categorise intrinsic and extrinsic motivation. Their motivation continuum also suits the research study which is interested in identifying intrinsic motivation and extrinsic motivators. The next stage was to apply codes to the data. These codes try to identify some aspects of the data which is important, but they also try to sound meaningful so as to aid the search for themes in the next stage.

4.5.1.6.3 Search for themes

It is now possible to arrange the coded data into themes and use visual or thematic mapping to establish relationships between the codes and between different levels of codes. Defining the themes requires a certain degree of researcher discretion and judgement but, as a guideline, a theme will tend to appear at several intervals in the data set. These themes are broader in scale than the codes. Table 16 illustrates this process.

The first stage was to list codes which appeared across the entire interview. During the search for codes it was recognised that some codes did not fit into the analysis of intrinsic and extrinsic motivation because they were actually barriers to motivation. These barriers to motivation should not be ignored because they illustrate aspects of university-industry collaboration which could be addressed by guidelines to improve the process.

| INTRINSIC MOTIVATION | EXTRINSIC MOTIVATION | | | AMOTIVATION |
|---|--|--|---|---|
| | <i>Identified Regulation</i> | <i>Introjected Regulation</i> | <i>External Regulation</i> | |
| Participates in tasks for interest and enjoyment | Participates in tasks because it is meaningful and fits with personal values | Participates in task for feelings of self worth or to avoid feeling guilty | Participates in task to gain rewards or to avoid punishment | Has no interest in task. Can identify no rewards, tangible or intangible |
| Opportunities to improve own knowledge and learning | Improving personal circumstances | Improving the lives of others | Career and job security | Not part of career plan |
| Developing | Values | Improving the | Rewards and | |

| | | | | |
|---|--|----------------------|----------------------------|--|
| own competencies | necessary for collaborative activity | Department | recognition for engagement | |
| Challenging previously held assumptions | Making knowledge more accessible & usable | Improving self worth | Role of an academic | |
| Seeing new opportunities for collaborations | Supporting the learning of others | | | |
| Decision making & accountability | Contributing to the Department's success | | | |
| Application of knowledge | Creating opportunities for meaningful collaborations | | | |

| Barrier to Career | Barriers to Motivation | Barriers to Project Work |
|--|--|---------------------------------|
| Personal circumstances | Economic / recession issues | Project design |
| Balancing traditional academic role with being more entrepreneurial academic | REF & type of research | People management |
| Budget and finances | Working with external organisations | Requirements of funders |
| REF | Lack of rewards, recognition, incentives | |
| | Balancing traditional academic role with being more entrepreneurial academic | |

Table 17 - Stage 3 - Search for themes

4.5.1.6.4 Review themes

After identification of the themes they need to be reviewed for coherence. This coherence should be both internal and external to the theme, meaning there should be coherence across the data set. Patton (1990) calls this “internal homogeneity and external homogeneity” (Patton, 1990; cited in Braun and Clarke, 2006, p.91).

It was felt that the analysis provided too many themes representing similar aspects of motivation so these were reviewed and similar themes were collated into single headings. This is shown in Table 15 but the main headings are summarised below:

| | | |
|------------------------------|-------------------------------|---------------------------------|
| PERSONAL IMPROVEMENTS | CAREER | ORGANISATIONAL |
| EXTRINSIC REWARDS | COLLABORATIVE ACTIVITY | KNOWLEDGE & LEARNING |

Table 18 - Stage 4 - Review themes

4.5.1.6.5 Define and name themes

This next stage is about establishing what the themes do or do not represent. A coherent description of the theme needs to be provided which establishes the story of the theme and how it fits in with the overall thematic analysis.

4.5.1.6.6 Produce report

The final task is to produce a short report. A report is produced for every interview and tells “...the complicated story of your data in a way which convinces the reader of the merit and validity of your analysis” (Braun and Clarke, 2006, p.93). The report should detail the following:

- the assumptions underpinning the themes;
- conditions underlying the themes;
- how the themes are spoken about and given meaning. This will involve using

- excerpts to illustrate the themes; and,
- revelations from the overall story.

For the purposes of this study the Data Analysis chapter provides this discussion and reflection on themes.

4.5.1.7 Cross-case analysis

Once the individual thematic analyses are complete a cross-case analysis can take place. This forms the Data Analysis chapter which follows. The chapter is organised so that there is initial focus on intrinsic and extrinsic motivators, and the barriers related to initial motivation to become an academic. This is followed by a consideration of intrinsic and extrinsic motivators and the barriers related to being an academic. Focus then turns to KTP activity. Data related to knowledge and partnerships is discussed in light of identified intrinsic and extrinsic motivators, and barriers. Personality traits and impacts (outputs, benefits, successes and rewards) of KTP activity are then considered in light of intrinsic and extrinsic motivators, and barriers.

The purpose of the cross-case analysis is:

- to assimilate themes from the individual thematic analyses. This will sharpen constructs by refining definitions and verifying the fact that emergent relationships between constructs match with the evidence in each case. This will deepen understanding and explanation (Miles & Huberman, 1994, p.173);
- to evaluate how individual academics are motivated by, and remain motivated by, involvement in KTP activity, and to see similarities in experience. Where evidence from the broad data set is similar, Eisenhardt (1989) argues that confidence in the validity of relationships will be enhanced and theoretical replication will take place. Guba and Lincoln (1981) and Denzin (1983) have argued against the validity of generalisation in qualitative research but, as Miles and Huberman (1994) suggest, the aim is to avoid data specific to just one individual;

- to identify intrinsic motivation and extrinsic motivators. By comparing intrinsic and extrinsic motivation evident in the data set to the Motivation Continuum by Gagne and Deci (2005) will confirm whether or not this tool is recommended for use in analysing intrinsic and extrinsic motivation in context such as university-industry relationships. It might be evident that this tool does not match with all the data from the individual studies and so alternative explanations will be sought. When these alternative relationships and explanations are considered the internal validity of the research study is improved.
- to induct aspects of the individual experience which were not identified from the deduction required for the design of the research questions. Prior experience of the researcher and a priori research was used to deduce the research questions but this evidence is related either to the experience of the researcher on a specific type of project, or to the experiences of a number of academics across a variety of university-industry collaborative projects. As a result it could be that not all data is appropriate or some explanations of individual academic motivation in the context of KTPs could be missing. When alternative relationships and explanations are considered the internal validity of the research study is improved.

Miles and Huberman (1994) write extensively on strategies for cross-case analysis and specify two approaches – variable-orientated and case-orientated analysis. Case-orientated strategies adopt Yin's (2009) replication strategy where a theoretical framework is used to study one case in depth and then subsequent cases are compared to see whether patterns match. In variable-orientated analysis researchers look for themes that cut across cases. It is also possible to adopt a mixed strategy where the approaches are combined. This research study has adopted Yin (2009) replication strategy where cases are compared to other cases in order to seek explanations.

Table 18 overleaf illustrates some of the themes occurring across the entire data set, for one particular question. From analysis of this data it would appear that many of the

academics interviewed did not set out to become academics, rather personal circumstances dictated a move into academia. In these instances they were not motivated by being an academic and could see no rewards tangible or intangible. They became extrinsically motivated when, for example, they suffered redundancy or they found their current role was not sufficiently intrinsically motivating. The prospect of a career in academia, where they could build upon the knowledge they had gained from their experiences in industry, was both intrinsically and extrinsically motivating. Evidence from this first question highlights that the initial theoretical statements or propositions might need adding to, with a new proposition being:

- that some individuals are extrinsically motivated by a career in academia when their personal circumstances change;
- that some individuals see a career in academia as an opportunity to apply the knowledge they gained from their experience in industry, for the benefit of others

The cross-case analysis continued in a similar manner using data from all of the interview questions. The aim was to see the relationship between the different constructs and to identify similarities and differences across the data set.

| Academic | EFFECTS OF PRIOR EXPERIENCE | | | | | | | | | | |
|----------|-----------------------------|--------------------|--|---------------------------------|--|------------------------|-------------------------------------|----------------------|------------------|--|---------------------------------------|
| | Intrinsic Motivation | | | | | Extrinsic Motivators | | | | | Amotivated |
| | Gaining new knowledge | Applying knowledge | Interest in linking previous industry experience | Freedom /Autonomy / Flexibility | Ability to reflect on knowledge / space to think | Personal circumstances | Able to gain further qualifications | Engaging with people | Link to teaching | University has close links to industry | Not part of career plan / by accident |
| 1 | Y | | | | | Y | | Y | | | Y |
| 2 | Y | | | | | Y | Y | | Y | | Y |
| 3 | Y | Y | | | | Y | Y | | | Y | Y |
| 4 | Y | | Y | Y | | Y | Y | | | Y | Y |
| 5 | | | Y | | Y | Y | Y | | | | Y |
| 6 | | Y | Y | | | Y | | | | Y | Y |
| 7 | | | Y | | | Y | Y | | | | Y |
| 8 | Y | | | | | Y | Y | | | | Y |
| 9 | Y | | | Y | | | | Y | Y | | |
| 10 | | | Y | Y | | Y | | Y | | | Y |
| 11 | Y | Y | Y | | | Y | | | | | Y |
| 12 | | | Y | Y | | Y | | | | Y | Y |
| 13 | Y | | | | | | Y | | Y | | |
| 14 | Y | | | Y | | Y | Y | Y | Y | | |
| 15 | | Y | Y | | | Y | | | Y | Y | Y |

Table 19 - Cross-case analysis of the effects of prior experience on individual intrinsic and extrinsic motivation

4.6 CONCLUSION

The purpose of this chapter was to understand the research philosophy, and methodology, as used in this study.

The *research philosophy* consists of epistemology, relating to acceptable knowledge, and the relationship between reality and the researcher; ontology, relating to the reality; and, axiology which considers the experiences of the researcher and the affects these could have on the research study. For this research study the most appropriate philosophy was (pragmatic) critical realism which is accepting of the multi layered nature of society and that social contexts can affect experiences. SDT, whilst corresponding more to positivism, does accept that social contexts can affect the satisfaction of basic needs. Positivist studies are interested in generalising to a population, but it is argued that because SDT has yet to be applied to understanding individual academic motivation to engage in KTP activity, a less generalised approach is warranted.

Demonstrated above were the processes by which data was derived, which was to be used as evidence of individual motivation to engage in KTP activity. The study was qualitative in nature and a case study approach was taken, with individual semi-structured interviews used as opportunity for the academics to speak about their experiences. The interview data was analysed firstly through identifying individual themes, and then, for the purposes of cross-case analysis, determining common themes, whereby the themes from the individual interviews were compared.

In the following chapter the data derived from the thematic and cross case analysis will be discussed. It will demonstrate the intrinsic and extrinsic motivators, and barriers to motivation, for academics engaging in KTP activity. Consideration will be given to the factors that caused academics to be interested in a career in academia, as well as the factors that continue to motivate their academic career. Following this will be a specific focus on motivation and KTP activity, which reflects the motivation to transfer knowledge, and work in partnership, as well as drivers such as success, impact, benefits and rewards.

5 - Data Analysis

5.1 INTRODUCTION

The purpose of this chapter is to present the findings from the data analysis, as described in the previous chapter, and interpret the findings with reference to a priori research and Self Determination Theory (SDT). The chapter is structured as follows:

- Pen portraits to provide informal descriptions of participants;
- Summary of the thematic data analysis process;
- Thematic analysis using interview data, a priori research and reference to SDT.

As suggested in the previous chapter this is a non-experimental study, which analyses qualitative interview data in order to determine intrinsic and extrinsic motivators of academics engaged in KTP projects. Barriers to participation are also considered. Conclusions have been drawn from secondary data, particularly journal papers and research reports, and in the main focused on academic motivation in the contexts of research commercialisation, patenting, and firm innovation about what act as intrinsic and extrinsic motivators to knowledge transfer, and what acts as barriers, in the context of university-industry collaborations. No evidence was found of studies which focus on individual academic motivation in the context of KTPs. The purpose of this chapter is therefore to share what motivates individual academics to engage in KTP, using interview data as evidence.

As can be seen from the chapter, structure reference will be made to individuals and how they demonstrate motivation, but the context will also be considered and the extent to which the academic and project environments impact upon individual motivation. SDT,

“...a macro-theory of personality, development, and well-being in social contexts that has used motivational concepts to hypothesise, organise, and predict phenomena” (Deci & Ryan, 2014, p. 16)

provides a theoretical base for this exploration, and the Motivation Continuum (Gagné and Deci, 2005) is a particularly useful tool for organising and interpreting data. By a careful consideration of individual and contextual factors, it is expected that there will be an inclusive, all-encompassing consideration of intrinsic and extrinsic motivators, and barriers to participation.

5.2 PEN PORTRAITS

The purpose of pen portraits is to provide

“...an informal description of a person or group of people – this may cover age and other 'hard' variables, but will focus on softer dimensions such as attitudes, appearance and lifestyle” (AQR, 2013)

The pen portraits below include the following 'hard' variables:

- Age;
- Gender;
- Geographic location of university;
- Previous roles and experience of formal knowledge transfer and KTP projects.

Softer variables, such as attitudes, will be covered in the thematic data analysis which follows in the sections below.

| | |
|----------------------|--|
| PARTICIPANT 1 | This academic is male, aged in his late 40s-early 50s, and is an academic at a university in West Yorkshire. Prior to becoming an academic he held senior roles in marketing at a national bank. He has been involved in formal knowledge transfer but this is his first KTP as academic lead. |
| PARTICIPANT 2 | This academic is female, aged mid-late 40s, and is an academic at a university in London. Her academic interest is food technology, and she has prior experience of working in industry and collaborating on knowledge transfer projects. This will be her third |

| | |
|----------------------|--|
| | KTP. |
| PARTICIPANT 3 | This academic is male, aged mid-late 40s, and is relatively new to academia having spent most of his career working in the City of London. He is involved in both the supervision and sourcing of KTPs, and has sourced approximately 10 companies for KTP collaborations, the aim to being to recruit senior managers interested in driving change at Board level. |
| PARTICIPANT 4 | This academic is male, mid-late 50s, and has worked in academia for 25+ years. He currently works at a university in London, but worked briefly in industry after graduation. His academic interest is mechanical engineering, and alongside teaching and research, he is Chair of a national Committee. He has supervised a number of KTPs, including prize winning projects. |
| PARTICIPANT 5 | This academic is male, aged late 40s – early 50s, and has worked in academia since graduation from his Doctoral studies. He began his academic career in Iraq, before his Ph.D. led him to a role at a university in the north west of England. His academic interest is water engineering and he has worked closely with industry on knowledge transfer projects, and specifically KTP projects. |
| PARTICIPANT 6 | This academic is male, aged mid-late 40s, and has spent most of his career working in the Ambulance Service. Changes to ambulance education meant that teaching became formalised within a university setting, and the academic, who is still a practising paramedic, is now heavily involved in the re-design of ambulance education. He has also recently engaged in his first formal knowledge transfer, via KTP. |
| PARTICIPANT 7 | This academic is male, aged late 30s-early 40s, and prior to his role in academia, worked in IT in industry. When his role in industry changed, he moved to a knowledge transfer / consultancy role at a university in the north west of England. Now heavily involved in research, he works on numerous knowledge transfer projects between academia and the housing sector. He has recently |

| | |
|-----------------------|--|
| | supervised two KTPs. |
| PARTICIPANT 8 | This academic is male, mid-late 40s, and worked in industry for 10 years before taking a full-time role in academia. His academic interest area is Construction and Built Environment Law, which he teaches at a university in the north west of England. More recently he inherited the role of managing Departmental KTPs, but he also has experience of supervising KTPs. |
| PARTICIPANT 9 | This academic is female, late 30s-early 40s, and before academia had a career in purchasing for a multi-national chemicals company. When her role in industry changed she took the opportunity to study for her degree, and in time completed her doctoral studies. She now teaches and researches purchasing at a university in the north west of England. She has been involved in formal knowledge transfer, and has recently supervised a KTP, and is about to start supervising her second. |
| PARTICIPANT 10 | This academic is male, aged mid 30s, and is an academic at a university in the north west of England. His academic interest is Corporate Governance. He has been involved with formal knowledge transfer and recently assisted with a KTP. He hopes to supervise his first KTP in the near future. |
| PARTICIPANT 11 | This academic is male, aged late 40s – early 50s, and has worked in academia for 25+ years. He teaches and researches Computer Programming at a university in the north west of England. He has worked on numerous formal knowledge transfer projects, and recently completed a successful KTP project. |
| PARTICIPANT 12 | This academic is male, aged late 40s – early 50s, and after a career in industry is an academic at a university in London,. His research interests include marketing and management, in relation to the Built Environment and Construction industries. He has worked as lead academic on two successful KTPs, and is engaged in a third. |

| | |
|-----------------------|---|
| PARTICIPANT 13 | This academic is male, aged mid-late 40s, and after graduation worked in occupational health. Having always been interested in teaching he applied for a part-time post at the north west university where he currently works. Over time his role changed until he eventually became Associate Dean. Due to restructuring he is now a Senior Lecturer who has engaged in numerous engagement projects, and now a KTP, in health sciences. |
| PARTICIPANT 14 | This academic is male, aged mid-late 40s, and managed his own company prior to his role in academia. After completing a doctorate sponsored by industry he worked as a lecturer / senior lecturer at universities in the north west, and West Yorkshire, where he currently works. His field of interest is in knowledge transfer, and he has managed a number of engagement projects, and KTPs looking at how this can be implemented. |
| PARTICIPANT 15 | This academic is female, aged mid-late 40s, and held down a successful career in retail. Changes to her role gave her the opportunity to pursue a career in academia, firstly in Further Education and latterly in Higher Education. She works teaching and researching Retail at a university in the north west of England. She has been involved in formal knowledge transfer projects and has recently completed a successful KTP project. |

Table 20 – Pen portraits

5.3 CROSS CASE ANALYSIS

Thematic analysis, following the Braun & Clarke (2006) approach, identified a series of themes applicable to understanding academic motivation to engage in KTP activity. The nature of the interview process determined that there would also be contextual data summarising what motivated academics toward an academic career, and what motivated them about being an academic in relation to their teaching, learning, and research roles.

The analysis is therefore organised into two discrete sections. The first focuses on the initial motivation to consider academia as a career, and subsequent motivation whilst

working in academia. The analysis is divided into intrinsic motivators, extrinsic motivators, and barriers and challenges to individual motivation. SDT uses the terms amotivation to behaviour that is neither intrinsically nor extrinsically motivated. The data analysis demonstrates that academic motivation was indeed challenged at times, but because academics remained keenly engaged it is argued that 'barriers to motivation' is a more relevant term to use in this study context. These barriers were organised in terms of barriers to project work, barriers to career, and barriers to relationships and were used as a principle of organisation for the research when managing her data set. This will be discussed in greater detail in the Discussion chapter.

The Discussion chapter also will show how when analysing interview data the researcher used the basic needs of autonomy, competency, and relatedness as a way of organising the research data gleaned for intrinsic motivation. It shows the connectedness between the concepts that the researcher feels exists and it is argued that SDT, having just a singular continuum for intrinsic motivation considers activity in terms of liking it, rather than considering it in terms of being competent, expressing volition or feeling related to the environment. For individuals engaging in KTP activity these intrinsic feelings are as important as a love for the activity because they support the academic to engage. KTP engagement is a complex situation so perhaps that is why there is evidence of behaviour which meets the basic needs.

The second section focuses specifically on KTP engagement. Considering that knowledge, including the developing and sharing of ideas and working in collaboration, are key aspects of KTP activity, it was felt appropriate to dedicate some time to a consideration of the intrinsically and extrinsically motivating factors. From the analysis it was also clear that when the academics were given the opportunity to reflect on their experiences of engaging in KTP projects, they also included important contextual data. This included reference to their personality, as well as the impact their activity had, including the benefits of their engagement, successes and outputs, and rewards generated. These are again considered with reference to intrinsic and extrinsic motivation. The section concludes by considering barriers and challenges to individual motivation to engage in KTP activity, as issues were identified which need addressing in the Discussion chapter which follows.

5.4 ACADEMIA – INITIAL AND CONTINUED MOTIVATION

At the beginning of the interview process the academics were asked what motivated them to become an academic, and what they liked about being an academic. They were also asked about their entrepreneurial journey and whether there were any external influences which affected their desire to be an academic.

5.4.1 Motivation to become an academic

The interview process began by asking the participants to reflect on what motivated them to become an academic. The table represents a summary of the intrinsic and extrinsic motivators, which are discussed in the section which follow:

| INTRINSIC MOTIVATORS | EXTRINSIC MOTIVATORS |
|------------------------------|--|
| Passion for subject (P9) | Lifestyle (P1& P2) & job security (P2) |
| Love of knowledge (P3 & P13) | Change in personal circumstances (P1, P6, P7, P9 & 15) |
| Intellectual challenge (P15) | Sponsored degree (P4 & 9) / Doctorate (P5 & P7) / Research sabbatical (10 & P11) offered insight |
| Enjoyed learning (P9) | Improve education for others (P9) |
| | Opportunity (being in right place at right time) (P2 & P11) |
| | Personal growth (P3) |

Table 21 - Intrinsic and extrinsic reasons for becoming an academic

5.4.1.1 Intrinsic motivators

Intrinsic motivators related to an enjoyment of learning and intellectual challenge.

Participants 3, 9, and 15 all mentioned how their “love of knowledge” (P3), their enjoyment of learning - “I actually just really enjoyed learning,” (P9), their passion for their subject (P9), “...being deeply interested in the creative processes” (P12) and their desire for intellectual challenge (P15), drove their desire to be academic. Participant 13 commented on how working in a university environment was appealing,

“I just quite like the idea that...I quite like engaging with people and I’ve always

thought that university is the hierarchy of knowledge so if I could work somewhere like that it'd be great" (P13)

To be intrinsically motivated by knowledge and learning means that they felt they had mastery over their own environment, and felt competent in their subject area. Prior to academia each were experienced workers in industry or commerce. Before their roles in academia they had all reached management level, and consequently would have felt competent that they could relate to others in the same field. Participant 3 was looking for an opportunity for personal growth, so he behaved autonomously in deciding to move to academia. Participants 9 and 15 were more driven by changes in their lifestyle – redundancy (P9) and single parenthood (P15) – but during their time in industry both had chosen to pursue opportunities for furthering their education, which suggests that circumstances merely provided a window for change which they were able to take advantage of by their own volition.

5.4.1.2 Extrinsic motivators

Extrinsic motivators related to lifestyle, opportunity, and growth, and were generally of the most autonomous, integrated form, because this behaviour was meaningful to the academic.

5.4.1.2.1 Lifestyle

With regards lifestyle Participant 2 felt that academia offered her a certain level of job security and it was a lifestyle that suited her, at the particular time. Participant 1 referred to academia as "...not a bad life" (P1), and it was an opportunity which suited him and his family when he was made redundant from his previous role. Also motivated by concern for her family was Participant 15. She had become a single parent and, after redundancy, was searching for a way to meet the needs of her son both financially, and with regards to practical issues like school holidays. Participant 14 perhaps summarised it best, when he commented on how being an academic changed life for the best,

"...suddenly I realised that being a Dad and at home was actually quite a novel thing. I was, we were almost a single-parent family because of my work, so that [being an academic] was fine" (P14)

and,

“So I’m a Dad as well as a husband as well as an academic, whereas before I was really an MD and not much else” (P14)

It would appear that these academics are not alone in wanting a role in academia because they believe it works for their family. Garrison (2005) reports on why individuals move from industry to academia, and whilst 'to teach' was the overwhelming desire, lifestyle change was second choice, and 'family' was listed as part of this lifestyle change. Whilst the academics expressed intrinsic motivation toward academia and engagement in KTPs, it was clearly meaningful for them to also support their family. Being an academic supports their basic needs for competency and relatedness, and they support their family willingly, so the activity is internalised, and their well-being supported.

5.4.1.2.2 Opportunity

Redundancy provided the opportunity for Participants 7 and 9 to explore a role in academia. Participant 7 was offered a place to study for a doctorate, whereas Participant 9 began by offering to teach, before completing her doctorate. Participant 12 returned to academia after working as a research associate, and a spell back in industry. Other participants also found themselves enlightened by their opportunities to study for further degrees, like Participant 10 who spent time on a research sabbatical which was “...short lived but very interesting” (P10), and Participant 5 studied in the UK for his doctorate and did not return to his home in Iraq because,

“...the chance came, the chance came to do this and I took it” (P4).

These academics wanted academic roles, particularly after their engagement in their studies. Their desire for an academic role addressed their need for competency and relatedness and they expressed a willingness to pursue this role, suggesting they behaved autonomously. It seemed that their motivation was less driven by external rewards and more driven by a desire for an intellectual challenge and an opportunity to research and test and develop theory.

For some academics the opportunity was not obvious,

“I suppose when I was at school I liked the idea of teaching but I didn’t want to become a teacher and then I just kinda muddled my way through...” (P13)

“I think it really came about by accident...” (P14)

but as they ended up working in the university environment, because of their situation, they met people who influenced their behaviour. Indeed, Participant 14 said about those that influenced him that he liked,

“...because they are prepared to engage. I don’t like, I’m not into the “ivory towers” thing” (P14)

and this is reflected in his commitment to knowledge transfer. In another interview, Participant 11 commented,

“Well I never wanted to be an academic at the start of it” (P11).

He had completed an Honours degree and a Masters but had no intrinsic interest in remaining in academia. By chance his Professor mentioned that he was doing some interesting work in a new field. He says,

“...at the time I had pretensions of going out into industry and working in industry, applied for a few positions and...[name deleted] convinced me that there was some interesting work going on in the Department which was very useful work” (C11)

and his academic role began from that point. He worked on knowledge transfer projects and Bercovitz & Feldman (2006; 2008) suggest that entrepreneurial inclinations become the norm in a department where the Head engages in knowledge transfer. Aschhoff & Grimpe (2011) refer to the idea of “professional imprinting” and the likelihood of knowledge transfer, when a professor engages in knowledge transfer

themselves. He became a research assistant even though it was his intention to stay only a year. Before a year had passed he was asked to teach, and later the university offered him a permanent role, where he has been employed for the past 25 years. Participant 11 clearly respected his professor and he found the project he was involved in to be interesting and went from being amotivated to intrinsically motivated. He proved competent at research and teaching, and had the freedom and autonomy to explore the research and teaching role, and was supported in doing so by his professor. His basic psychological needs were therefore met.

Participant 2 was initially motivated by a desire to be involved in setting up a food development centre. She had worked in industry for a number of years and was invited to be involved by a professor who had taught her as an undergraduate. She was interested in the opportunity because it related to her work in industry, and the role offered a degree of autonomy, and met her needs for competency and relatedness. Participant 6 was also motivated by the needs of his industry. He works in a branch of the emergency services, whilst holding his academic role. He recognised with changes to government legislation would take place which would require the setting up of a new education programme. Despite the fact that other related professions questioned the legitimacy of his profession, he felt strongly that he wanted to use his extensive experience and his academic qualifications to redress the balance, and drive his profession forward. He applied for a role in academia in order to do this, because he wanted to be an advocate for his profession. He addressed his need for competency by studying for qualifications enabling him to lead his subject, and he did this willingly and with support from his profession, thus ensuring his behaviour was internalised.

5.4.1.2.3 Improving education

Participant 9 felt strongly about improving the education of others. After studying for her undergraduate degree she felt much of what she was taught was outdated, and needed refreshing with up-to-date examples direct from industry. She commented,

“...there were two reasons why I wanted to get into academia – being here there were some very good lecturers who inspired me and there were also some who were rubbish and I thought ‘I could do a much better job than you’”
(P9)

and,

“...when I came here I was slightly frustrated that a lot of the stuff they were teaching was outdated, wrong, had not much relevance. I wanted to rectify that” (P9)

This drove her desire to be an academic when the opportunity arose and personal circumstances dictated. She was passionate about her subject and loved to learn, but was also extrinsically motivated by the desire to make teaching relevant to others. It was a meaningful activity which addressed her need for competency and relatedness, and which she pursued freely and willingly, thus meeting her need for autonomy. Participant 3, although intrinsically interested in his subject, had autonomous motivation in his pursuit for personal growth. He had worked in the City of London for a number of years and, after an MBA, had worked in consultancy roles. By chance he became involved in European Community funded projects, which enabled him to make the transition to academia. Reflecting on why he chose to make a move he commented,

“...once you are in business you have to make a decision – do you carry on in there or are you going to have some sort of personal growth as well” (C3)

He expressed a “love of knowledge” suggesting he was intrinsically motivated by academia, and academia provided the opportunity to pursue this and to develop as an individual. Being in an autonomy-supportive environment he was able to embark upon doctoral study, as well as teach and engage in enterprise, which also addressed his needs for competency and relatedness to a group.

5.4.2 Being an academic

SDT has not specifically been used to understand individual motivations whilst working in academia, so this provides an opportunity to consider why a role in academia might be intrinsically and extrinsically motivating. If an academic is provided with sufficient challenge, interest, opportunities to develop competencies in an autonomy-supportive environment, then SDT suggests an academic would be intrinsically motivated. Similarly if basic needs are met and rewards, either tangible or intangible, are

administered which are meaningful, then the academic should experience extrinsic motivation of the least controlled type.

Similarly to the previous section which considered intrinsic and extrinsic motivations driving the desire to be an academic, this section will consider intrinsic and extrinsic motivation related to being an academic. These are summarised in the table below:

| INTRINSIC MOTIVATORS | EXTRINSIC MOTIVATORS |
|---|---|
| Asking interesting questions | Collaborations / New partners & friends (P6) |
| Thinking through ideas | Providing up-to-date knowledge (P9) / Influencing teaching and learning (P4, P11) |
| Develop & test theory / Link between theory & practice (P7, P11, P15) | Gaining experience from working with experienced researchers (P6) |
| “Intellectual noodling” (P7) / “Academic tourism” (P4) | Students challenge thinking (P15) |
| Engage in a variety of projects (P2) | Supportive line managers (P6) |
| New experiences (P2) | Providing students with real-world experiences (P9) |
| Research as a hobby (P10) / Love of knowledge (P3) | |

Table 22 - Intrinsic and extrinsic motivators related to being an academic

5.4.2.1 Intrinsic motivators

Intrinsic motivators related to being an academic are divided between those relating to intellectual challenge and those related to novelty and variety derived from academic life.

5.4.2.1.1 Intellectual challenge

The majority of participants described, to varying degrees, how they are motivated by the intellectual challenges posed by a role in academia. Participant 4 was able to find a balance between what he liked and enjoyed, and what he had to do as part of his academic role and career.

Participant 10 felt that research was a hobby, which he enjoyed and was getting better

at doing the more he practised. Participant 3 expressed a “love of knowledge” and Participant 10, a love of research, and Participant 7 liked “intellectual noodling.” They found it was intrinsically interesting to be able to ask questions and to have the opportunity to think through ideas. They enjoyed this activity which challenged them to think, and to question their beliefs. Academia provided the freedom to develop and test theory arising from these questions and ideas, and the opportunity to publish and present research confirmed a sense of relatedness to the academic community.

Participants 7, 11 and 15 described how it was important for them to make a link between theory and practice. Participant 12 commented that another academic helped him make a link between theory and practice,

“...I'd worked in industry beforehand and I suppose what I was doing then was sitting on a pin head looking out and he really inspired me to look in the sky and focus in, and marry the two together” (P12)

This activity was meaningful to them, and was extrinsically motivated behaviour, but it was also intrinsically motivating to develop and test theory. Participant 11 described how as a doctoral student he sought the opportunity to work with industry, and to then develop theories that would benefit society. He referred to how he blended theory and practice and rejected the notion of the academic who just focused on theory. He explained how he had

“...always had this desire to bridge the gap between theory and practice...”
(P11)

and how, despite having “...quite a strong basis in theory” (P11) he liked to

“...make sure all software that you develop actually works and you can prove that the software works, and much of the motivation I have comes from there”
(P11)

For him his work had to

“...have science stuff, and the engineering, and the theory stuff, all under the same cycle” (P11)

and this process clearly was motivating. He commented,

“...One of the best things that happened was the more applied work for the hospitals because you can see the benefit it has on individuals” (P11)

Participant 7 agreed,

“Really, if you are building theory, and I’m not saying theory building isn’t important, you should be testing theory” (P7)

Academia gave them the freedom to develop their competencies, and share their knowledge both with the people using their research, and also with other academics in the same research field. Their needs for competency and relatedness are met, and delivered in an autonomy-supportive environment.

5.4.2.1.2 Novelty and variety

When reflecting on what was motivating about academia, Participant 2 realised that if she left she would miss the opportunities she got to engage in a variety of projects. She confirmed that,

“...actually I probably don't realise how lucky I am but that ability, the freedom, the research freedom...” (P2)

It was something she enjoyed and valued about academia, which was more difficult to obtain from a role in industry. Participant 4 explained how he liked nothing more than engaging in what he calls “academic tourism” –

“We have the ability to write things, disappear off and do conferences. You’ve got the ability to do bits of research, you’ve got the ability to engage with people on real projects and actually get yourself involved in industry and do

things that are useful. All sorts of things” (P4)

The nature of academia, the emphasis on research and academic freedom, provide the support for academics to act autonomously, and experience intrinsic motivation. Engagement in novel projects, and a variety of projects, provides academics with opportunities to develop their competencies and to form relationships to support their basic need for relatedness.

5.4.2.2 Extrinsic motivators

Extrinsic motivators were related to collaborations and working with colleagues which supported the research roles held by academics. Supporting students via teaching and learning was also extrinsically motivating, and a key method for sharing knowledge.

5.4.2.2.1 Working with colleagues

Those participants with less experience in working in academia were motivated by the opportunity to work with colleagues. These colleagues tended to have been in their situation for a number of years, and consequently had a good number of contacts, and influence over academic research, teaching, learning. Participants 6 and 15, for example, expressed gratitude toward those more experienced academics who had worked with them on projects, and who had encouraged further interactions. There is an externally regulated reward attached to this behaviour, but it is also of personal value because the academic has appreciated the collaboration. Productive research environments, according to Ramsden (1994), have skilled leaders who are experts in their area and who demonstrate a participatory style of leadership. These leaders will also frequently communicate with their colleagues and be accessible to them. Participant 7 described work colleagues who demonstrate effective leadership styles. One was creative, and someone the participant greatly respected for his views. The other person had a management style which the participant liked. This individual

“...walks the floor. How he treats people is important. His engagement with people is important because it’s an engagement based industry” (P7)

According to Winter and Sarros (2002) academics generally find their immediate supervisor supportive and this would seem to be the case from those interviewed for

this study. Immediate supervisors provide the relatedness support required so that the individual can act autonomously and demonstrate competence in their discipline. The immediate supervisors tend therefore not to affect participant's intrinsic motivation. The exception would be Participant 6 who, as a less experienced academic, found it difficult when a personal ally left. She was,

“Good boss, good mentor, an academic, an all round thoroughly nice person”
(C6)

He also described her as “...our greatest ally, my own greatest support” (P6) and “...the guardian of our team” (P6) because she helped him manage his way through the system. She offered him the relatedness support and whilst he remains “...still very enthusiastic” (P6), he recognised that “...we now have to manage upward” (P6). He had to negotiate the management system to ensure he remained responsible for his team and its ways of working, and both ideals are extremely important to him.

5.4.2.2.2 Working with students

Elton (2001) believes that teaching and research are correlated when learning occurs. Good research creates new knowledge, and good teaching transmits something new to the learner, and in this process learning takes place. Teaching without research is not university teaching. The connection between teaching and research is also expected by students; they expect their lecturer to be at the cutting-edge of research, and demonstrate enthusiasm and commitment (Ramsden and Moses, 1992; in Coaldrake and Stedman, 1999, p.19). As Hattie and Marsh (1996) suggest though, research and teaching compete for time in the academic workload. Those with a more defined teaching role tend, according to Winter & Sarros (2002), to find themselves having less opportunity for research and hence to publish and as a result they have less influence on decision making, and struggle to derive recognition and rewards. This is because publications which result from research as Ramsden (1994) suggests, are the main source of academic esteem, are required for REF, promotions and competitive research funding and reflect the impact the academic is having on his / her research area. Research quality is therefore peer judged. This is in contrast to teaching where quality is judged by fellow academics who might well be successful in their research area. But as Elton comments, teaching is “...a private activity conducted by

amateurs” (Elton, 2001, p.44), and their competence in this area is difficult to judge.

With regards to learning, Participant 1 enjoyed providing his students with 'real world' experiences. He found it meaningful,

“I’m very, very, keen that people get experience of implementation” (P1)

and

“What I am very, very keen on doing is making sure our students can do the job. So I like that degree of freedom” (P1)

and so he used his academic freedom when he chose to employ simulations to teach concepts, rather than more traditional teaching methods. This is an example of what Elton (2001) calls ‘deep learning’ where new knowledge is integrated with existing knowledge and students are active in the learning process. Participant 1 recognised that these experiences extended the knowledge of his students but also that the students challenged his knowledge and level of competence. But when students,

“...just want the lecture material, and their goal is to get a pass at the end of the day, it’s a challenge...” (P1)

This challenged his motivation because it was not interesting for him to teach using more traditional lecture methods, and it was not meaningful to him because the students were not interested in learning and they sometimes chose not to engage.

Other participants also commented on how they enjoyed developing student knowledge and found it meaningful to engage in intellectualising and challenging them. Higher Education teaching deals with unresolved problems and is, according to Elton (1990), a joint endeavour between university teacher and learner.

Participant 15 never saw herself as a lecturer and commented, “I’m not brilliant with undergraduates” because, “I feel like a mum to them. I have a 22 year old myself” (P15). She felt however, that she had a very different experience with postgraduates

and mature students and what she particularly liked was that they,

“...challenge me back. And that I can cope with. Sometimes the students that others don’t like, they think are mouthy, questioning too much...I love them. The little lambs who sit there intensely all the time I can’t stand them” (P15)

She was motivated by those students who challenged her to think, and being in an environment that supports the development of knowledge, it gave her freedom to work in the way that suited her and her students best. Together they learned and she enjoyed the experience.

Participants 4 and 11 held positions of influence, which allowed them to make connections between academia and industry. Participant 4, comments,

“I work with the Institution of Engineering Designers quite a lot where I am one of the Vice Chairmen so that means that I’ve got probably one of the best understandings of the education environment for engineering design around. And to know that you’ve got that experience and expertise and to have that confirmed by other people I am very appreciative” (P4)

This was beneficial for his motivation as well. He would rather

“...influence the people who are influencing my profession than put a paper out for other health academics, who use academic techniques to criticise it” (C4)

He acknowledged that academia was subject to particular ways of working and what he did perhaps challenged traditional practices. For him this was meaningful and appealed to his personal values, so it was integrated into his behaviour.

He commented that it,

“...confirms up I am quite capable of doing things. I do quite a lot of work also with learned bodies and I have a second hat on which I sometimes wear which means I can be one or the other, although at some meetings I can be both...”

(P4)

His need for competency and relatedness were met through his engagement with learned bodies. Academia provided him with the freedom to pursue these opportunities and, although it occasionally caused him time pressures, he found the experience to be motivational for himself and beneficial for his discipline.

5.4.3 Barriers and challenges

The motivation of the participants was challenged, at times, because of time pressures. This affected the ability to conduct research and/or enterprise activity, and to find opportunities for personal development. Other factors that caused participants to feel de-motivated related to the feeling that there was a two-tier system in operation in academia, which placed academics at newer universities below academics from Russell Group universities. Some academics were also concerned about the levels of academic snobbery between those with doctorates, and those without. The following table summarises the issues to be discussed in the following sections.

| BARRIERS TO MOTIVATION |
|---|
| Not enough time for research / challenge to balance research and enterprise / difficult to delegate |
| Two-tier academia / difficult to compete with Redbricks / “academic snobbery” / “us” and “them” mindset |
| Issues with career progression / time for personal development |

Table 23 - Barriers to motivation with regards being an academic

5.4.3.1 Time pressures

Lack of time affects the ability to research and publish papers, both of which are main sources of esteem for academics (Ramsden, 1994). Participant 9 recognised this all too well, commenting specifically about the challenges of trying to balance research with enterprise,

“We technically can get a Readership on it (Enterprise) but the baseline... I applied for a Readership on it for Enterprise and they said no because the

baseline is still that you need to have 4 Ref-able papers. So if you want a Readership you still need to do the research and it's very difficult to do the research when you are doing the Enterprise. So there's a recognition route although in practice it's not that way" (P9)

Participant 9 also wanted her students to avoid dry, outdated examination orientated learning and this was partly her motivation in becoming an academic. She wanted to make learning meaningful to her students. Whilst the academics generally liked teaching there are associated issues, which challenged their motivation. Time is a key issue. Participant 9 made the comment that teaching itself was easy, but marking and administration took time. Participant 1 also made a similar comment about the barriers to enterprise work,

"Well barriers are always 'doing the day job.' The day job I see as teaching and the administration associated around it" (P1)

And Participant 2 commented similarly,

"...the time I have to devote to teaching and project supervision is restricting my time that I can engage with industry" (P2)

They had less time to dedicate to academic discovery, and the intrinsic motivator of knowledge, because of the time allocated to teaching and administration. As Winter and Sarros (2002) found in their survey of Australian universities,

"...a more defined teaching role means fewer opportunities to be research active, influence decision making, and derive recognition and rewards" (Winter and Sarros, 2002, p.248).

This was highlighted by the fact that, as Participants 1 and 9 explain, there are no means by which to measure teaching quality fairly, and no specific recognition for good teaching.

For Participant 4 his role in academia, which entailed working with industry and working

with students on projects, actually distracted him from research, despite the fact that he knew that it is research which the university rewards. He commented,

“...the problem is that I don’t actually spend enough time doing some of the research bits and pieces and the research bits and pieces are the things that the university in its wisdom, or lack of, appears to be the only things that motivates them. We are not really a research-led one yet we’ve got a Head of Department who only seems to think research” (P4)

Despite the lack of time and the pressure to meet research, teaching and enterprise arrangements, alongside administrative commitments, participants did not feel able to delegate to other colleagues. This was partly because there was no one else to delegate to, and partly because they were cautious of the abilities of other people. Participant 9 commented that pride stopped her from delegating, because she was, and wanted to be, proud of the work she had done. She experiences integrated regulation because the desire to do well in her work is correlated to her personal values and traits. Participant 15 is also not keen and said,

“I don’t want to be responsible for others’ work...For my work? There’s nothing worse...I suppose it’s having the power and control. Being an academic we are quite lucky in that” (P15)

suggesting that she found autonomy provided by the role to be intrinsically motivating. Her behaviour is a form of integrated regulation because it is referring to something external to her, specifically her reputation, and her personal values which seek to protect her reputation. She experienced the most autonomous form of extrinsic motivation because she had the freedom to not have to delegate her work, and in doing so protected her reputation, and this appealed to her values. Interestingly, despite having her own time pressures she was willing to help another colleague who was off sick, because she believed that this colleague would do the same for her. This also was behaviour that was extrinsically motivated, but is integrated regulation because it matched her values and was autonomous because she made the choice as to whether or not to assist her colleague.

5.4.3.2 Academic snobbery

One of the biggest challenges facing academics at newer universities is the fact that they are expected to compete with Redbrick university academics, on an unequal footing. Participants 1 and 6 felt that their universities only appreciate research, and especially research which contributes to the REF. Participant 10 explained that newer universities cannot compete in terms of research, and students view the universities as less academic for that reason. Participant 9 was also vocal, explaining how newer universities face “academic snobbery” not from the Redbrick universities themselves, but from the Funding Councils and the policies behind them, which she feels “...are trying to squeeze us out of their research” (P9). She argued that Redbrick universities have a different teaching model, which is more accommodating in giving academics time to dedicate to research and publishing. Fortunately she was intrinsically motivated by her role in academia, and particularly her industrial engagement projects. They were also meaningful to her, and fed into her research and teaching so had extrinsically motivating benefits.

Participant 6 commented on the fact that because he was busy leading his course he found it difficult to find time to engage in personal development, and felt he had no skills to win contracts. He was not alone in finding it difficult to find time to engage in personal development. Participant 2 commented that,

“I have been out of industry now for 10 years and I am starting to feel my confidence in engaging with industry is certainly diminishing....I am not up-to-date any more...so the academic, the time that I have to devote to teaching and project supervision is restricting my time that I can engage with industry”
(P2)

She recognised that academia had given her security and the life she knew, so she felt it was a closed loop. She felt that additional personal development could be offered to academics engaging with industry because, as she says, “I know industry has moved on” (P2). Without engagement with industry she would not have up-to-date case studies to offer her students, or research resulting from her professional practice, and so would not have career beneficial incentives to motivate her. She had no time to dedicate to professional development and this was challenging her motivation. It was

also not helping her develop her career, and possibly was a contributing factor as to why she expressed a desire to leave academia.

Other issues in the work environment relate to politics and responsibility. One participant felt there was an “us and them” mindset, between academia and management, at his university. Management wanted to appoint a new Enterprise Manager who will

“...try and, not coerce, but persuade us to give up something in relation to doing enterprise” (P10)

but this had left academics unwilling to engage in enterprise, and Participant 10 sensed a negativity towards it. He recognised that negativity existed but he was still personally enthusiastic because he found the work interesting, enjoyable and meaningful. Such coercion could be seen to be undermining one of the cornerstones of academia, that of academic freedom. Taking away the responsibility for making decisions removes the freedom to engage in enterprise activity. This is neatly summarised by Participant 4,

“I think sometimes there is responsibility...you have the academic responsibility but someone takes away the responsibility here because they impose ways of working onto you. We’ve had some issues recently where the level of responsibility expected is ridiculous and is de-motivating and you get an achievement of one thing and it gets taken away by somebody else who sees it from a different agenda. That can be a problem” (P4)

His intrinsic interest, and belief that what he engages in is valuable to society, enabled him to remain motivated by the activity itself. This demonstrates why there is value in considering de-motivation in terms of barriers and challenges rather than amotivation which suggest lack of intrinsic or extrinsic motivation. The management systems in universities can de-motivate staff and, in extreme examples, lead staff to want to leave academia, and this will be explored in the KTP section.

5.4.3.3 Career and personal development

The final area of discussion relates to the “rhetoric of career progression” (P1),

particularly in relation to academia and enterprise engagement. There are challenges for those academics who do not have traditional or classic academic careers – the progression from degree to postgraduate, and then lectureship, without a break – because they have spent time in industry. Spending time in industry and working with industry however was still attractive to them hence the reason they engage in KTP projects and other enterprise engagements. A number of the academics did not feel that the universities sufficiently recognised the value of their activities. As Participant 9 commented, “...there is a recognition route although in practice it’s not that way” and her university rejected her application for a Readership in Enterprise because she did not have sufficient REF papers. She was frustrated by the fact that there is a recognition route in practice but, in reality, it is harder to attain. She does understand why restrictions are placed on a promotion based purely on commercial work. In her eyes, commercial work is not academic work. In this sense she is motivated by the traditional academic mores – that research and publishing are the cornerstones of an academic career – which are extrinsically motivating because they are meaningful and lead to externally regulated rewards, but the lack of communication about progression routes is a challenge.

Participant 13 commented that the “...stupid archaic hierarchies” (P13) meant that he was moved from his role as Associate Dean, as he did not have a doctorate or hold a professorship. Participant 1 felt that a two-tier academia was in operation. He did not have a doctorate and was without highly graded papers, and he felt there was a snobbery related to research and research output. Both he and Participant 15 commented on the pressure to get impact, and to publish, and both concluded that applied papers, or more qualitative studies, were perceived as less valuable than 'blue sky' research quantitative papers. Participant 15 commented about her research,

“It’s just not rated as highly as it should be in REF terms...it’s not the type of research that gets used” (P15)

and with regard to qualitative work,

“unfortunately if you are looking for high REF scores this is what they don’t seem to like” (P15)

Whilst challenging, it is not in every sense de-motivating because of her values and traits. She continued,

“It’s very important for me that what I’m doing makes a difference and helps people do their job better” (P15)

which suggested that her behaviour was a form of integrated regulation. Being an academic, working in an environment which values academic freedom, means she had the autonomy to work on projects which appealed to her personal values.

5.5 KNOWLEDGE TRANSFER PARTNERSHIPS

As has already been made clear a KTP project is comprised of a lead academic, a student Associate and a company that requires assistance from knowledge transfer, to embed greater capability to ensure its survival and growth. From the perspective of the academic lead there are three key components to a KTP – knowledge (development and application), transfer (sharing the knowledge and collaborating) and partnerships (supporting the Associate, the company, and the University mission, and collaborating with the KTP team).

5.5.1 The benefits and challenges of knowledge transfer

The literature review identified the benefits of knowledge transfer, and the challenges posed by university-industry interactions designed at knowledge transfer. According to Wang & Noe (2010) knowledge transfer is the sharing and acquisition of knowledge (as differentiated from knowledge sharing, which is the provision of task information to help others, and, knowledge exchange, which is knowledge sharing and knowledge seeking). In the case of KTPs, the companies acquire the knowledge shared by the Associate, and this knowledge has been developed by the academic at knowledge base, the university. Likewise the Associate acquires knowledge from the company which informs the academic, and acts as a conduit by acquiring knowledge from the academic, which is then shared with the company. The academic shares their knowledge with the Associate and with the company, and acquires knowledge about the needs of the company, or about business interactions, for example. The circle of knowledge acquisition and sharing continues. Knowledge transfer is no longer a linear,

researcher driven activity (Wilson et al, 2010; cited in, Ward et al, 2011, p.297) but a dynamic, iterative process, a social process.

Feldman (2014) reflects on the lived experience of academic entrepreneurs, especially with regard their learning and behaviour. She concludes that some of the benefits of engagement are that it is enjoyable and intrinsically rewarding, and it results in a wider social circle. There is also the possibility of personal growth and benefits are brought to the university. To be motivational there needs to be a culture which encourages knowledge sharing, emphasises trust and co-operative team work, and fosters innovation. It also has to be an environment where it is perceived that advice will be given, and an environment conducive to knowledge sharing. Management support is also important, as are extrinsic rewards which lay emphasis on co-operating to get the reward (Wang and Noe, 2010; pp.118-119). Barriers to knowledge sharing include a lack of trust, a lack of social networks and a lack of opportunities to share knowledge, a lack of time, the fragmentation of time and differing time-scales, and a lack of rewards and incentives (Gagne, 2009; Francis-Smythe, 2008; Lockett, Kerr, & Robinson, 2008). There are also issues about different perceptions of IPR and fears about the dilution of academic freedom, which Lam (2007) neatly summarises as to do with cognition and competencies, and careers and incentives.

5.5.2 The relationship between Self Determination Theory and Knowledge Transfer Partnership engagement

Identifying the benefits, that is cultural and organisational aspects of KTP engagements, as important for understanding motivation, it is also important to understand engagement and motivation from a theoretical framework, which in this case is SDT. SDT is interested in the quality and level of motivation and believes that autonomous behaviour leads to better attitudinal outcomes than controlled behaviour. Autonomous behaviour can be intrinsically motivated or extrinsically motivated when it is integrated into the person. Gagne (2009) argues that a person who is intrinsically motivated might be passionate about sharing their knowledge, but the quality might not be the most useful because an individual's enthusiasm perhaps leads them to be a little too 'carried away'. She argues that the most useful and efficient form of knowledge

sharing (different from transfer as defined by Wang and Noe (2010) but still carries an important message) is derived from the desire to be useful to others and to help reach shared goals. This behaviour is integrated into the individual and is the most autonomous form of extrinsic motivation. This ability to act autonomously is fostered in an environment where there is choice and meaningful positive feedback, and where there is 'interpersonal ambiance' (Gagne & Deci, 2005, p. 339), where behaviour can be internalised and endorsed by significant others. According to Gagne and Deci (2005) autonomous behaviour also promotes citizenship, trust, commitment, satisfaction, and well-being, which correspond with the values of the KTP.

In previous sections intrinsic and extrinsic motivators of academia were considered, and a similar structure will follow in this section which is dedicated to KTP and motivation. The sub sections consider knowledge, the sharing and transfer of knowledge, and partnerships and the intrinsic and extrinsic motivations of academics. The barriers and challenges to motivation are considered in a separate sub section. Before turning to these areas and highlighting data, reference is made to the card sort exercise which was conducted after the initial discussions. The purpose of this was to provide a space for the participants to reflect on their engagement in recent KTP activity, and differs from traditional semi-structured or close questions.

5.5.3 Card sort - the story of a Knowledge Transfer Partnership

The format for the interview generally followed a traditional semi-structured method, and began with questions which allowed the participants to explore their initial motivation in becoming an academic, and their motivations whilst working in academia. The purpose of these questions was to settle the participants into the interview process. The format then turned to discussing KTP engagement. Again, in order to provide a period of reflection, and a break from traditional questions, the participants were asked to consider how they would re-tell their story of their recent engagement in a KTP project. As a reminder, they were provided with the following cards to use:

| | | |
|---------|-----------|------------|
| Novel | Complex | Habitual |
| Intense | Uncertain | Satisfying |

| | | |
|-------------------------------------|------------------------|-------------|
| Variety | Enjoyable | Challenging |
| Connection to teaching and learning | Connection to research | Competitive |

Table 24 - Card sort word selection

The following illustrates the number of participants selecting to use a particular word in their story

| Word | No. of uses |
|--|-------------|
| Challenging | 15 |
| Enjoyable Satisfying | 14 |
| Complex | 13 |
| Novel | 12 |
| Variety Connection to teaching and learning | 11 |
| Connection to research | 10 |
| Uncertain Competitive | 8 |
| Intense | 6 |
| Habitual | 5 |

Table 25 - Card sort – number of uses per word

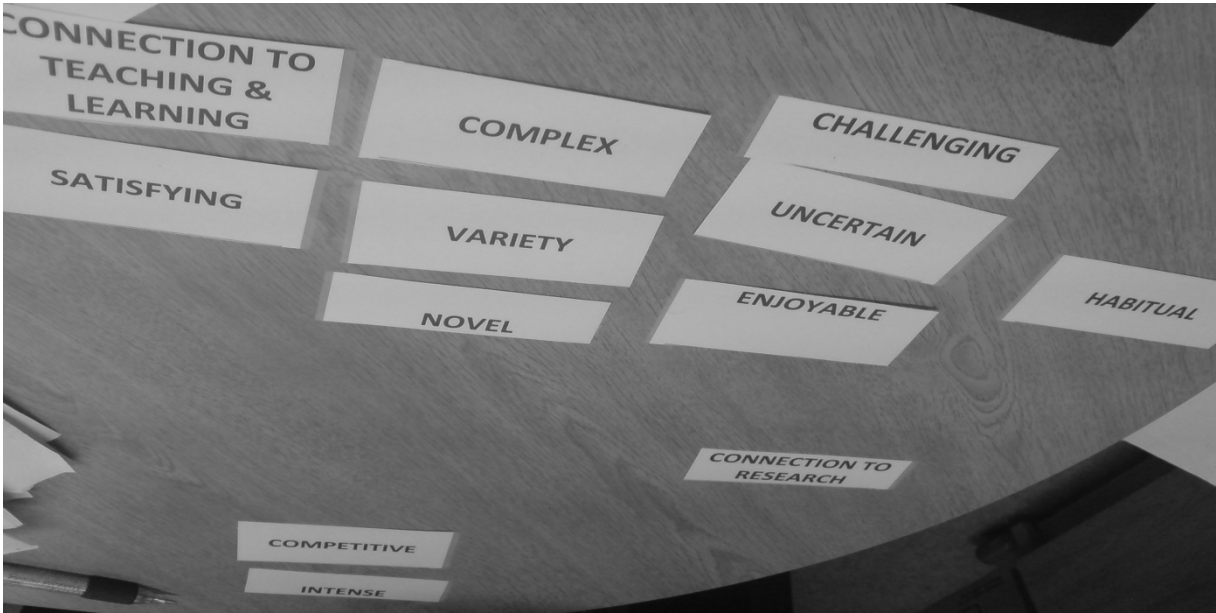
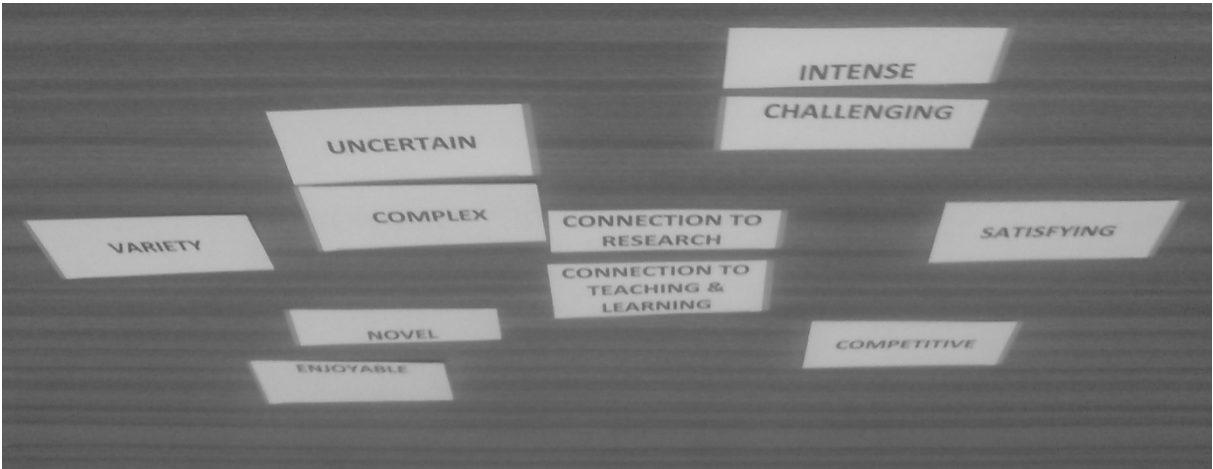
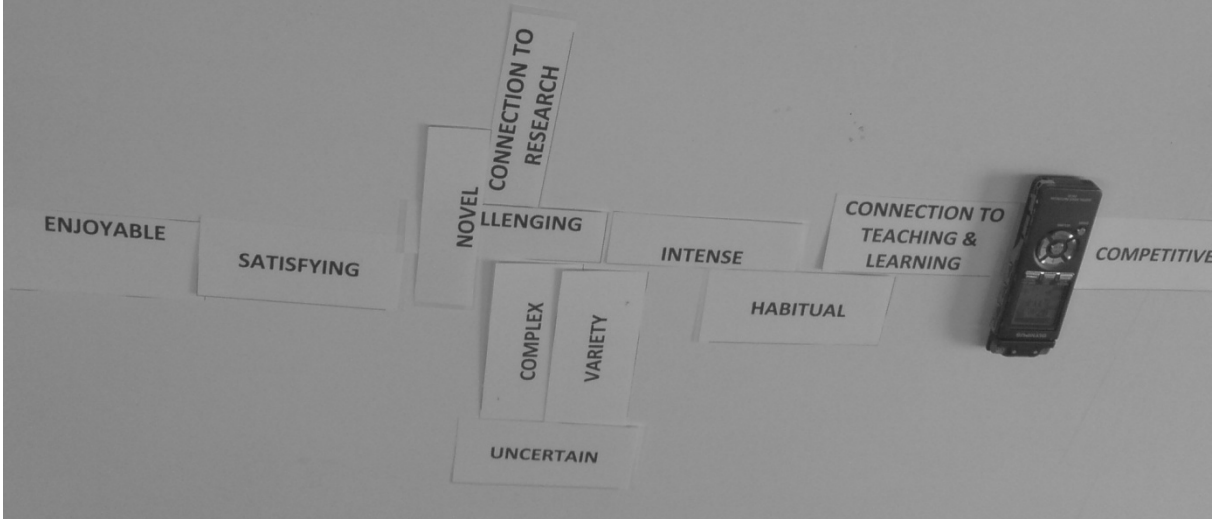
CHALLENGING featured in each card sort, but did not necessarily feature at the same points in the story, as is demonstrated by the photographs on the following page. Participant 13 began his story describing how it was challenging to develop the KTP, and that there were levels of complexity, because the idea was NOVEL. He clearly enjoyed the process and concluded it was SATISFYING. Initially, academics were intrinsically motivated by the activity. The idea that it might be challenging to develop a project, and there might be a degree of uncertainty does not seem to have deterred

them from engagement. The complexity offered by the project provided them with an opportunity to use their knowledge, and share their competencies, which for some was satisfying and enjoyable. Others, whilst intrinsically motivated, were also extrinsically motivated by the opportunity to compete to develop new products and projects.

Commonly following on from initial intrinsic motivators were extrinsic motivators, which in this case were the CONNECTION TO TEACHING AND LEARNING and the CONNECTION TO RESEARCH. The activity was meaningful to the academics because it offered opportunities to develop competencies and share knowledge with students and peers, over the course of the project and afterwards. This supported their need for relatedness, and the nature of academic and KTP activity allowed them to choose how best to transfer their knowledge.

The stories tended to close by either describing how the projects were ENJOYABLE and/or SATISFYING, or by referring to the project as being INTENSE. Participant 10, who was new to KTP projects, closed his story by using HABITUAL, which he explained by saying that he wanted engagement to become something he did regularly. Participant 2, who found her motivation to be an academic waning, and her patience tested during the project, ended her story saying the experience had been CHALLENGING, had VARIETY, and was ENJOYABLE, and, SATISFYING. Despite her issues she was still intrinsically motivated by the experience because her basic needs were satisfied. She may have found that she did not always receive sufficient support from the company or her department, but she had taken the decision to use her knowledge and competencies to consider how she might redress this imbalance.

Figure 16 - Sample card sort exercises by participants



5.5.4 Knowledge

Knowledge can be defined as “...a fluid mix of framed experience, values, contextual information, and expert insights” (Davenport and Prusak, 1998; cited in, Gagne, 2009, p.572) and a “...critical organisational resource” (Wang and Noe, 2010, p.115). KTPs involve the process of knowledge transfer, distinct from knowledge sharing or knowledge exchange (Wang and Noe, 2010). Knowledge transfer, be it either the sharing or acquisition, was not seen as a barrier to motivation for the participants. Instead it was something they enjoyed doing and was meaningful to them.

5.5.4.1 Knowledge sharing

Knowledge sharing was more dominant than knowledge acquisition, most likely because the nature of KTPs is to focus on enhancing the capabilities of the Associate and the company, and sharing knowledge is a means by which this is achieved. Indeed the overarching criteria for all KTPs empathises that whilst there must be

“...clear benefits to the Knowledge Base Partner, including target outcomes,”

the Knowledge Base Partner

“...will provide the appropriate expertise, having regard to the knowledge, skills and technology / technologies to be transferred during the course of the Project”

and

“...there must be a clear need for knowledge/ skills / technology input from the knowledge base to the projects that make up the proposed Partnership”

(Arts & Humanities Research Council, 2011)

which suggests that the academic should be less focused on their own acquisition of knowledge, and more focused on the sharing of their knowledge.

Wang and Noe (2010) reflect on some interesting factors regarding knowledge sharing.

Relevant to SDT and knowledge sharing is their argument that knowledge sharing is contingent with individual confidence in sharing of useful knowledge. It is therefore an extrinsically motivating process to share knowledge when the individual feels this knowledge is meaningful to others. Additionally, they argue, if an individual believes in their own information then they will be internally satisfied and will be motivated to share knowledge. As Wang and Noe (2010) suggest, knowledge sharing appears to be related to the belief that knowledge has benefit and usefulness to others, rather than in it having personal benefit.

The following table summarises the intrinsic and extrinsic motivators of academics engaged in KTP activity, and specifically refers to knowledge.

| INTRINSIC MOTIVATORS | EXTRINSIC MOTIVATORS |
|---|--|
| Developing ideas through discourse (P1) | Engaging with individuals with common interests (C7) |
| Drawing on skill base (P2) | |
| Applying knowledge (P2, P4, P7) | |
| Acquiring new knowledge (P4) / Develop new techniques (P11) / Novelty (P11) | |
| 'Real' engagement providing different sense of world (P7) | |
| Connection to research (P11) | |

Table 26 - Intrinsic and extrinsic motivators for Knowledge Transfer Partnership engagement

5.5.4.1.1 Developing ideas

Part of the KTP process is to share ideas in order to develop a project. This process can be extrinsically motivating and meaningful, whilst also being intrinsically motivating. Participant 1 commented that developing ideas through discourse was particularly enjoyable. In SDT terms, developing ideas through discourse provides a sense of relatedness because the ideas are developed with the organisation in mind. Participant 2 commented that, despite finding a recent KTP engagement stressful, she enjoyed it because,

“This one was challenging and it really drew upon my creative skills, my

research skills, my industry knowledge” (P2)

Feeling competent and able to share knowledge appears to be an important motivator, which is neatly summarised by Participant 7 when he commented, “...knowledge gives you confidence...” (C7) and this confirmed why competency is also important. According to SDT, feelings of competency develop when an individual feels they are master of their environment. When the opportunity to engage in a KTP “...very much played to my strengths and experience” (P7) this academic felt motivated by the opportunity to explore his subject area, to generate ideas and share knowledge, and develop solutions, and felt it would be an interesting challenge. Relatedness was also important, as Participant 7 explained,

“...when you’ve got somebody involved because they are interested in the topic area, then they are usually very good because I think people are interested in sharing...” (C7)

This comment suggests that the collaboration between two willing partners is likely to be stronger when both parties are intrinsically motivated by the subject area. This has important repercussions for how KTPs should be organised and managed. Bringing together two people lacking a strong interest in the research area could however lead to increasing de-motivation for one or other individual, because they may feel neither competent in the subject, nor related to the other individuals.

At some universities the process for engaging in KTPs involved an approach from the KTP office in order for a project to be developed. Participants 2 and 4 knew that if they were approached by their KTP offices, they could use their knowledge to develop projects. Participant 2 found this process intrinsically motivating and interesting because it did not pose the same challenges as KTPs which originate from the KTP team office, and which she felt were sold wrongly to the companies involved. The participants showed they had the knowledge and competence to develop ideas which the KTP process supports and because of the nature of academic life they were provided with the freedom to choose to explore these opportunities.

5.5.4.1.2 Knowledge acquisition

KTP projects allow not only the company to acquire knowledge, but also provide the opportunity for academics to ask questions and evidence from the interviews suggests that academics acquired knowledge from asking questions. They also found that by asking questions they could challenge held knowledge. The participants provided several examples of how asking questions and gaining new knowledge was motivating. Participant 4 referred to a project on which he worked in collaboration with someone particularly skilled in its technical aspects. The participant is skilled at solving problems, and likes solving problems, but because the problems were not immediately obvious, this provided an interesting challenge. The collaborator would “...exasperate us with the next network that he made” (P4) but “...he was great fun to work with” (P4) and the academic found this intrinsically motivating because it tested his own competencies and helped him acquire new knowledge.

Participant 7 found engagement in KTP projects “...it’s real, because actually they have a different sense of the world” (P7) and the work is “...orientated around a problem” (P7). The research problem the project was investigating was ‘uncertain’ and ‘complex,’ but also ‘challenging’ and ‘enjoyable’, with people collaborating to unpick the intellectual puzzle. Problem solving and acquisition of knowledge also motivates Participant 11 as he seeks to “...develop new techniques” (P11). This process also had a connection to his research and added a level of novelty. When the knowledge acquired was transferred and needed refining by theory, or when the systems were applied to new ways of working, this was intrinsically motivating. Academics have to want to acquire knowledge, and if they do then the KTP process provides opportunities by which to gain new competencies (and confidence), and form new collaborative relationships.

5.5.5 Partnerships

Relatedness, understood as the need to feel connected to a referent group in order to function in an optimal manner, is one of the three basic needs according to SDT. A significant part of the KTP is based on the relationships between participants, specifically how they partner and collaborate and, as a result, relatedness has relevance to an exploration of how partnerships work and are motivating. SDT, whilst not directly stating which features of a work environment encourage a sense of relatedness, does offer clues from existing research. A study by Reis et al in 2000

showed that when an individual engages in meaningful interaction with another, feels understood and appreciated, and enjoys participating in shared activities this contributes to a sense of relatedness and a feeling of general well-being (Reis et al, 2000, cited in Ronen & Mikulincer, 2014, p. 119). The purpose of the following section is to consider whether the need for relatedness is met from engagement in KTP activity, and if it leads individuals to function at such a level that they are intrinsically motivated.

The following table summarises the intrinsic and extrinsic motivators related to working in partnership and collaboration, when engaging in KTP projects.

| INTRINSIC MOTIVATORS | EXTRINSIC MOTIVATORS |
|-----------------------------|---|
| | Being visible to Company (P10) |
| | Working in team (P6) |
| | Working with experienced colleagues (P6) |
| | Mentoring role (P1, P10) |
| | Appreciative of KTP office (P5, P7, P10, P11) |

Table 27 - Intrinsic and extrinsic motivators for partnership working

5.5.5.1 Teamwork

Ronen and Mikulincer have studied the factors they think might be relevant to relatedness satisfaction in the workplace and one of their conclusions is that the cohesiveness of the group is important (Ronen & Mikulincer, 2014, p. 119). This has a relevance to the following discussions about teamwork. They suggest that where a group feels cohesive, group members feel more secure about their work base, feel more confident that their peers will support them, and more likely to feel united in pursuit of project goals. An individual's need for relatedness is then met and they are more likely to behave autonomously.

Being a relatively inexperienced academic, engaging in his first KTP, Participant 10 believes it important to be seen attending meetings and being visible to the Company. For him it shows he cares and it is part of relationship management. This echoes the comments from Ronen and Mikulincer as detailed in the previous paragraph. Being

visible and available to the group improves group cohesion, and makes the group feel supported and more likely to work together to reach agreed goals. It also means the academic gets the fullest of experiences from the engagement. Participant 10 acts out of his own volition, and in time it should benefit him if the group remains stable and willing to share ideas.

Where a group is cohesive then teamwork also has the benefit of being a platform for making long term contacts. Participant 14 felt that working with people made work enjoyable, and Participant 6 found working in a team also to be enjoyable, but because he lacked experience he found working with experienced colleagues could be beneficial to him. These colleagues made this less experienced academic more confident and more willing to share ideas. He felt supported, and he related to the other participants, and feels he has benefited,

“...it’s a cross faculty project and I’ve met some really nice people to who it truly is a transfer of knowledge because they have transferred their knowledge to me” (P6)

and,

“...on a personal level I’ve got two new friends and two different partners to work with. That I’ve never had, and one particularly is a well published researcher” (P6)

The experience of KTP is personally beneficial in terms of his personal development and will have a future benefit with regards his career and his ability to publish research. Motivationally, as his positive comments suggest, he has a greater sense of well being and, if this continues, he is likely to feel increasingly autonomous in his behaviour.

5.5.5.2 Being supportive and being supported

Ronen and Mikulincer also reflect on how the behaviour of supervisors can enhance autonomous motivation. In the case of KTPs lead academics act, in a sense, as supervisors to students associates and the company, in the way they lead the project. If leaders exhibit what Ronen and Mikulincer call prosocial behaviour then

subordinates are more likely to feel secure in their work, which in turn supports their need for relatedness. Prosocial behaviour includes guiding, mentoring, and listening (Ronen & Mikulincer, 2014, p. 119).

Part of the role of lead academics is to ensure that the Associate is sufficiently well supported in the ability to transfer knowledge. Generally the academics enjoyed this role with Participant 1 seeing it as a mentoring role. Mentoring the associate so the associate is able to deliver the most effective support to the company supports the Associate's need for relatedness, and enhances autonomous motivation. The academic acts with a sense of volition with regards to how they support the student and because the activity is meaningful to them. For Participant 10 this is reflected in his comments regarding student engagement in KTP activity. He liked the fact that a KTP was carefully designed around the Associate and the Company and felt that Sandwich year students too often feel the selection for places is random, but that "...it's different in this case" (P10) and there is a "degree of success in the fit between student and organisation" (C10). He liked "...the value of selecting a key student, a good fit" (P10) and felt that the difference it makes to students who go on placement year is "phenomenal" (P10). This suggests that he is motivated when the activity matches what he believes to be meaningful.

Prosocial behaviour, offering support and guidance, was in evidence with regards the behaviour of the internal university KTP managers. Supportive KTP teams "take away the administrative burden" (P5), "....takes away the stuff that de-motivates you..." and deals with the "mundane" (P7), and "reduce the bureaucracy" of the KTP projects, thereby allowing the academic to work on meaningful activity. Participant 7 also collaborated with his KTP office to develop the project, and the office acted as a "sounding board" (P7) and raised questions and concerns which were addressed together. Participants 10 and 11 also expressed appreciation for the support they received from their KTP office. It is clearly important that if the need for relatedness is to be supported, and autonomous behaviour and intrinsic motivation to be enhanced, that bureaucracy and administration associated with KTPs is removed, or at least reduced.

5.5.6 Further drivers for Knowledge Transfer Partnership engagement

The following section considers factors related to academic engagement in KTP activity which do not sit specifically within the contexts of knowledge and partnerships. These factors included personality traits, the impacts of KTP activity, rewards from KTP activity, and personal and organisational barriers and challenges which impact on motivation to engage in KTP activity.

5.5.6.1 Personality traits

Some aspects of behaviour were identified to be important indicators of engaged academics. The following table summarises the intrinsic and extrinsic motivators.

| INTRINSIC MOTIVATORS | EXTRINSIC MOTIVATORS |
|----------------------|---|
| | Being proactive (P5) |
| | “Due diligence” (P1) / “Engaged scholarship” (P7) |
| | Manage expectations (P7 & P11) |
| | Doing better (P14) |

Table 28 - Intrinsic and extrinsic motivators of Knowledge Transfer Partnership engagement, as related to personality traits

Participant 14 was motivated by “being the best I can” (P14) but continued to seek opportunities to do better. He acted on his own volition, and it was his own criteria for “being better” by which he assessed himself. He felt frustrated when he did not perform as well as he would have liked, but sought ways to improve, referring, for example to how he was in the process of co-authoring a book reflecting on his teaching practice and knowledge transfer. This is an example of the least controlled form of extrinsically motivated behaviour because the activity is meaningful, addressing his need for competency through the co-authorship of the book. By sharing his knowledge his relatedness needs would also be supported.

Being proactive, for example, can result in a KTP project. Engagement in a project is an example of an extrinsically motivated activity, where academics have been proactive and acted on their own volition and as a result, this is the least controlled form of motivation. Participant 5 refers to being proactive and for him it is clearly

meaningful,

“...you have to be proactive rather than reactive and academia is never a reactive business. If you are reactive then you are just sitting there doing nothing. You have to be proactive, you have to go and explain yourself so basically you have to go out and say that’s who we are and that’s what we can do” (P5)

This is an example of how engaging and interacting in activities which promote meaningful talk, collaboration and sharing, meets an individual need for relatedness, and the need for relatedness from other project members.

Another driver for engagement is what Participant 1 called “due diligence,” or what Participant 7 referred to as “engaged scholarship.” Both academics described 'real world' engagement, be it a due diligence to engage in real world projects to ensure teaching is relevant, as in the case of Participant 1, or in collaboration and negotiation with industry to produce jointly held knowledge (Van de Ven, 2007, p. 7). Both reflect a desire to willingly serve society and the academic community. Participant 7 said that “you really need to be interested, involved, motivated...” and “engaged scholarship” allowed him to apply his knowledge and work on a project with people he was able to form working relationships with because they share common interests. The environment in which they operated was supportive of their desire to share knowledge, and because their knowledge was viewed as important to the project, it reinforced feelings of competency. Their desire to serve society was not, seemingly, intrinsically motivating because it was not expressed as something they found interesting or enjoyable, but was a version of the least controlled form of extrinsic motivation because was meaningful to them.

As part of engagement activity there has to be a desire to manage the project. Project management skills were important to the smooth running of the project, and for a number of the participants it was something they enjoyed doing and found intrinsically motivating. The academics expressing an interest also had experience working in industry prior to their role in academia. For Participant 1 managing a project like a KTP was simply an extension of his role in industry. He felt competent managing both the

project and project finances and, as a consequence, felt able to master his environment. He was supported by his KTP office, which addressed his need for relatedness, and the nature of KTPs meant he had the autonomy to decide how to manage the project. His three basic needs were met and so he was intrinsically motivated. Participant 7, although experienced in industry prior to academia, said he was increasingly motivated by authority, control, and responsibility. When he first took up a role in academia he was involved in projects where he did not have the same authority, control, and responsibility that he was afforded by KTP engagement. Engagement in KTPs have allowed him to decide how to manage his projects, so his autonomy need is met, as is his need for competency which was met through his engagement in the project and the sharing of his knowledge with the company. He also found the relationship with his KTP office to be important. He explained how he collaborated with them on the KTP proposal and documentation, and he found this to be beneficial. Collaborating with the KTP office in this manner supported his need for relatedness, which internalised his behaviour, and consequently he experienced intrinsic motivation.

Another aspect of project management that Participant 7 touched on was the management of expectations. He felt this to be important and had meaning for him. Participant 11 also found himself in a similar situation and he recognised that he had to take alternative action,

“The original KTP stated the aim to develop this for one site and we weren’t going to expand it and not go for full blown for any system, and at the time I was asked to do three sites and I said, ‘No, no, impossible. We can’t do this. It will take years. We shouldn’t be putting it in the plans.’ So I held my ground and we didn’t do that” (C11)

He acted in the way that he did because it was meaningful to him to ensure that the project was a success, both in terms of outputs and reputation. His knowledge made him cautious but the collaboration and system actually worked very successfully, and it proved possible to expand it to a point that the Company was working across fourteen sites.

5.5.6.2 Impacts

Engagement in KTP activity benefited not just the individual academic, but also the student associate (and students taught by the academics) and the company involved. The academics found this to be meaningful, and satisfied their basic needs, showing their engagement as being the most internalised type of extrinsically motivated behaviour. This section will consider the benefits, outputs and successes as detailed by the academics.

The following table summarises the intrinsic and extrinsic motivators of KTP engagement, as related to impacts.

| INTRINSIC MOTIVATORS | EXTRINSIC MOTIVATORS |
|---|--|
| Advising the company (P1) | Build capacity (P2) |
| Developing new insights (P5) | Making a difference to the company (P4, P15) |
| New research projects (P5) | Company using and valuing knowledge (P1) |
| Learning what it meant to be part of a company (P8) | Generating value for the company (P1) |
| “Straddle two worlds” (P3) | Generating additional revenue for the university (p5) |
| Keep in touch with industry (P2) | Repeat business for the university (P5, P7) |
| | Not financially motivated / wrong place for financial rewards (P1, P5, P7, P10, P15) |
| | Extra payments (P3) / Financial rewards (P9) |
| | Positive feedback (P4, P7, P8, P13, P14) / Awards (P11) |
| | “Happy clients” (P7, P14) |
| | Academic reputation (P1, P4, P11) |
| | Teaching & curriculum development (P1, P2, P8, P11) / Shows academia to be more than teaching & learning (P9, P10) |
| | Working with experienced academics (P6 / P15) |

Table 29 - Intrinsic and extrinsic motivators, as related to impacts and Knowledge

5.5.6.2.1 Making a difference

One of the key purposes of KTP activity is to build capacity into the company that is part of the partnership. For some companies this will contribute to their potential for long term survival. Participant 2 worked with a company facing a number of issues, and whose long term survival was later to be called into question. She explained how she applied her knowledge and competencies to the business problem and that, as a consequence, the company was able to survive the recession. She explains how, after problems were fed back,

“I would go away and based on my knowledge and capability that we have here, think of a solution, prepare a presentation...” (P2)

And then,

“...the recession hit half way through the KTP. So if it wasn't for the KTP and the way we changed the programme as – there were major changes to the programme as we went along. If they didn't implement those changes I don't know if the Company would still be alive” (P2)

Her motivation here was not intrinsic, but rather she was motivated by a desire to help because the survival of the company, and the project, were meaningful to her. Her relationship with the company was not always easy, but being able to work with a company to solve their problems satisfied her own needs for relatedness and competency. She engaged in the activity freely, and made her own choices with regards the management of the project. It is not suggested that she engaged because of feelings of guilt, but rather she said that she enjoyed the stresses of the engagement as well as having the ability to make her own decisions. Despite the, sometimes, taxing relationship with the company her motivation was an example of the least controlled extrinsic motivation.

Participant 14 commented,

“Well I think my job’s to make people understand, to help them understand and to find ways in which we do touch, where there can be real advantage” (P14)

and Participant 15, mentioned, “I just like to see that what we are doing makes a difference” (P15), when she was asked what were the benefits of engagement. Making a difference to the company was a clear goal for a number of academics, and it was a strong motivator. Participant 4 also worked on a project “which made a significant difference” (P4) and, believed he was the catalyst which made things happen. His explanation was enthusiastic and he was clearly motivated by this opportunity to make a difference as an academic working closely with industry to ensure educational standards are met in within a university context. He never questioned his competency and felt secure in his knowledge. Consequently his need for relatedness was met because he felt a connection to the project members, and to industry generally. The engagement was meaningful to him, and because he determined the methods of engagement with the company his need for autonomy was addressed; his motivation is the least controlled by external bodies.

Another motivator was the ability to see the company using and valuing the knowledge they were shared. Participant 1 commented,

“I find it quite motivating because I quite like helping businesses develop. Going right back to my very early days in my career, way before academic life, I used to advise small businesses going back to the late 70s. So I’ve always been interested in business...it’s something I’ve always found quite interesting so that’s the stimulation” (P1)

Participant 1 is intrinsically motivated by the opportunity to advise small businesses. As master of his own environment, he felt competent and supported and was able to determine his actions because academia provided that degree of autonomy. He was also happy for his ideas to generate value for the company,

“...if they are using the ideas then they get value of the marketplace, then I’m quite happy with that” (P1)

and this is an example of an extrinsically rewarding activity. It is the least controlled motivation because the activity was meaningful to him. As a result of his ideas generating value for the company his need for competence was satisfied. In addition his need for relatedness was satisfied because his connection back to industry provided an opportunity that he relished.

With regards to using knowledge and competency to address concerns within the company, the relationship between academic and company was shown to be two-fold. Participant 5 worked on a project with a national water company. The project aimed to change chemical processes to biological processes, and the KTP

“...helped them into realising that aim and it’s not complete but we are working at it and I can see it’s important” (P5)

It was meaningful to the participant and the company because,

“I think it changed the business view of [the company] which is really good. We are in the news all the time. They still come back to us if they want anything” (P5)

Sharing knowledge was a motivating experience for the participant because not only was it a meaningful exercise which provided scientific breakthroughs but it also had some externally regulated motivators such as repeat business, which could lead to additional revenue for the University and interesting new research projects. The three basic needs were met because the structure of academic research, such as KTP projects, provided opportunities for academics to trial new ways of working under the auspices of the university, which is a research supportive environment encouraging free thinking and the development of ideas.

5.5.6.3 Benefits

The benefit of engagement for Participant 12 was the level of knowledge transferred. He commented,

“I think that is proving to be the most valuable to me and the one where there

is the greatest knowledge transfer to them” (P12)

He is experienced at working in industry but the project area was untested and untried, and therefore it motivated him. Not all the academics interviewed, though, had extensive experience of working in industry. Participant 8 for example learnt about what it meant to be, if just in a nominal way, part of a commercial organisation. He saw this as a “real success” and “...certainly learned a lot and learnt a lot about being involved” (P8). For Participant 12 it allowed him to stay in touch with industry, and,

“working on a series of research that engages with the private sector or the public sector on the ground, including a range of KTPs, gives you, not only the academic view but industry views, a number of views” (P12)

Importantly, it also addressed possible barriers between academia and industry. He commented,

“it used to be the case that, and some people still do, say that academia was the “ivory tower” and not engaging with industry, but clearly that is improving a lot over the years, and a lot of research is much more geared towards societal, needs. But in some ways a lot of business has created its own “ivory towers” at a senior management level...” (P12)

and,

“And I actually think that academics engaging with industry can help at the most general level just, I don't mean to say at ground practitioners in reality because they are, but to ground them in a broader horizon of reality. So I think that's an important contribution” (P12)

Engagement matches that need for relatedness, that need to be part of a group that understands each other, and provides a supportive environment.

For Participant 3 this was an opportunity to “straddle two worlds” and it was an opportunity he relished. “It gives you confidence” said Participant 14, and in a similar

manner, Participant 2 felt she benefited from engagement in KTP activity because it brought her back in touch with industry. She enjoyed the experience which is a key benefit for academics, as documented in the KTP report by Regeneris (Regeneris Consulting, 2010). The contact she was afforded addressed her need for relatedness. Returning to industry, she felt she was back in the company of people she understood, and who understood her. They needed and used her knowledge, and acted on her advice, and this satisfied her need for competency, whilst KTPs provided an environment which was supportive of her autonomy.

“Fabulous feedback” was motivational for Participant 14, and getting positive feedback and having “happy clients” (P7) was motivational for Participant 7. These are representations of extrinsically motivated behaviour, but because it is meaningful for the academic to have formed successful relationships which they can control, and because they were working on a project they had chosen, their behaviour is internalised and their motivation autonomous. Where a project is successful it is also beneficial to the academic, as this quote from Participant 7 suggests,

“For me it’ll be successful if they hit their objectives because then they have a successful engagement with the University. For me, success is repeat business and relationships ongoing” (P7)

This sentiment was echoed by other academics, and ongoing relationships are both beneficial to successful activity, and motivationally important because they meet the individual need for relatedness and competency. So long as the relationships are able to flourish in an autonomy supportive environment, then academics will continue to feel they are able to be effective in addressing the concerns of companies with which they collaborate.

Behaviour was more controlled and less internalised where reputation was concerned. Participants 4 and 11, who are both experienced at engagement, were very aware that reputation followed from these effective engagements. Reputation is related to the ego, and despite the fact that it might be meaningful for academics to form good working relationships with industry, there is still a degree to which they are motivated to protect their reputation, and thus motivation will be controlled by external agencies. Participant

1, who had worked for a number of years in industry before being employed in academia, demonstrated an ego controlled response to his experiences of engagement. His university provided him with the autonomy to engage in meaningful activity, and allowed him to form relationships which satisfied his need for relatedness and competency but, he also believed that his University is "...just a University. It's the scope, and what they allow me to do is more important" (P1). He sought to protect his own reputation within his discipline by sending only competent students to work on projects. These students were less likely to have problems when working on projects and therefore both his, and the student's reputation, would be protected.

Another benefit, highlighted by the Regeneris (2010) report, is that knowledge gained from KTP engagements often feeds into teaching and "curriculum development" (P2) because it provides case study material and acts as a teaching aid. KTP engagement clearly made a difference to the work of, and the way in which Participant 12 worked. He stated that it,

"...maintains confidence levels and gives opportunities to further build confidence levels of the relevant skills of what you do, the depth and richness of what you do in research and in teaching. You become confident through – it's a by-product, it's an intangible by-product of using your skill sets in the KTP or research. That's a combination of technical knowledge in the sense of theory and other empirical knowledge that you bring to bear on the competence of working with people, of supporting the Associate and so on" (P12)

For many academics the opportunity to share with their students was a key driver for KTP engagement. Participant 8 got a "...buzz out of engaging with students" (P8), and in a sense this controlled his motivation more than engagement. Engaging with industry was how he responded to the strategy of his School, and engaging with students was intrinsically motivating.

Participants 1 and 11 identified 'connection to teaching and learning' as key when they used the card sort to describe the story of a recent engagement. Participant 1 wanted to,

“...get students to relate the big world to what’s happening here in terms of this lecture material” (P1)

and Participant 11 explained that,

“...what you will find...are examples of projects I have been involved in which liven a lecture up so that the students are actually benefiting from the experience I’ve had in those projects” (P11)

Participant 11 therefore found it meaningful to share his experiences because then, “...they feel they are not just being taught from a textbook” (C11).

Participants 9 and 10 were motivated to show their students that an being an academic means more than just teaching and research, and that enterprise is an important cross-cutting theme which can be fused into teaching to provide interesting and up-to-date case studies. According to Participant 10 it gives lecturers “...an extra bit of legitimacy” (C10) and opens the minds of students to the ‘real world.’ This is an extrinsically motivating activity, integrated into their behaviour, because it is meaningful for them, and matches values they believe in and support. They were intrinsically motivated by the separate entities of teaching and enterprise, but to combine the two meant the subject of their teaching had even greater relevance.

5.5.6.4 Outputs

Regeneris (2010) state that KTP impacts include providing information for research in general and providing information leading to research papers, and these impacts were referred to by the participants. For many academics, publications are an important measure by which they are judged so not surprisingly there was some discussion about what impact they have and how they were used to transfer knowledge.

Publications are a form of an externally regulated reward because the motivation to engage in such activity is controlled by external forces which determine that academic success is dependent on publications. Participant 6 felt he benefited from the KTP by being able to work with a more experienced academic in the production of a

publication. He "...will go under the protection and umbrella from them" (P6), meaning they dealt with comments and criticisms. From her recent engagement Participant 15 hoped to get a "peer reviewed paper" and an "account of practice," the latter of which,

"...won't count for me in the REF, it's nothing to be honest, but it'll be good for her [the evaluator for a public health KTP] because her name will be in print. It'll be good for us as a Business School because it shows we are out there doing stuff" (P15)

For both academics their basic need for competency is addressed because the publication is a representation of their knowledge, and their need for relatedness would be met through the sharing of their paper with their peer group. Whether their need for autonomy was met is questionable. It is well known that academics need to produce academic papers to benefit their academic reputation, and also to benefit their School / Department. So, despite the activity being meaningful to them, it is also to a degree controlled by external parties, hence the reason why it is not a form of intrinsic motivation.

5.5.6.5 Successes

KTP success metrics can be based on increased turnover and sales, for example. Participant 12 commented that his project had,

"...already established some metrics for repeat business with the client contractor and that has already paid off. So they know even before the KTP started that the approach was working for them" (P12)

and further commented,

"There is no way within the life of the KTP that this was going to yield improved strike rate or repeat business but they are confident that it will. The aim of it is to put everything in place so then it can be" (P12)

In his KTP Participant 4, had, for example, to meet sales targets, produce prices, and organise a timetable for product development. Although they struggled with the

timetable and price, he was pleased that they exceeded the sales target and,

“...a year later the Company turnover had increased by 40%, largely as a result of this strategic involvement of this product getting them more business, not only with this product, but with other things. So we were extremely pleased with that. We hadn’t expected that” (P4)

The Participant gave credit to the Managing Director, whom he felt knew both her target market and the people with whom she was dealing. Success is an external control on motivation, but it was clear that Participant 4 was enthusiastic about how well the project had done, reinforcing his confidence in his academic abilities. His need for relatedness was met because of the working relationship he formed with the Managing Director, and because he engaged out of choice. Success here is related to the most autonomous form of extrinsic motivation.

The project Participant 11 engaged in was mentioned in terms of an award. The participant felt honoured to be (potentially) receiving it on behalf of the project and when asked how he would feel he said,

“Well that would be great for everybody involved. It would be an honour. The Associate would benefit a lot, the Company would, and so would we at the University, so it would be great for everybody” (P11)

He believed that the award meant that the project had had an impact. The award was an outcome of his commitment and interest, and there is a general consensus that group based incentives, and rewards which are non-controlling and focused on verbal positive feedback and recognition, do not have a detrimental effect on knowledge sharing (Gupta and Govindajaran, 2000; Quigley et al, 2007; in Gagne, 2009; pp.572-581)

5.5.6.6 Rewards

These can be financial or good team player award, for example, and are tangible and, according to SDT, will significantly decrease intrinsic motivation if they are regarded as salient by an individual. The majority of participants did not receive any extra payments

for engagement in KTP or other commercial activity. Participant 3 was the exception. He was specially recruited by his university because of his expertise, knowledge, and, experience of the commercial world. Whilst he appeared interested and enthusiastic about KTP projects, and engaged in projects as an academic lead, his role was primarily to recruit high profile individuals working with the organisations Board to develop projects. At his University and at other institutions additional financial rewards have generally been withdrawn so his case was unusual and he acknowledged this:

“...you may find this a slightly different perception from others because, erm,...I’m paid cash for being involved in these projects” (P3)

He also said

“I know that most of us are not in academia for cash. So cash is a hygiene factor...” (P3)

which suggests that financial rewards do not control his motivation. Herzberg used the term ‘hygiene factor’ in his “Two-Factor theory” (Herzberg, 1968) to describe those factors that caused dissatisfaction in the workplace. Motivating factors are intrinsic to the role and in order to create a harmonious environment individuals should be encouraged to engage in challenging activity and companies should consider whether they are paying their staff fairly to ensure good levels of job security. There are a number of parallels with SDT, particularly in terms of the belief that challenging work is intrinsically motivating, and tangible rewards are more de-motivating than recognition and appreciation.

The majority of academics expressed no desire to be financially rewarded for their engagement in KTP activity. Participants 5 and 15 believed, for different reasons, that academia was the wrong place for financial rewards:

“If you are in academia and you want to make money then it’s not the right place to be. We’re here to educate, and to work, and research, and hopefully to enjoy the ride” (P5)

and,

“We used to get financially rewarded. Yeah that made a huge difference. That’s not right when people are unemployed and there’s a recession. I have to question myself “Am I indispensable?” I take home a full-time salary so I can live with that one” (P15)

Both participants identified themselves as strongly altruistic, philanthropic, and, nurturing on the Likert Scale, and in SDT terms, financial rewards did not act as a control over either individual. They experienced the most autonomous form of extrinsic motivation because the activity they engaged in was meaningful and acknowledged their competencies, and was conducted in autonomy-supportive environment.

The majority of participants were not motivated by money, commenting for example,

“...if you are personally motivated to want to get involved you should get involved whether you are paid for it or not...But people who get involved in enterprise wanna do it because they wanna do it. Someone like me, or [name deleted], do it because we enjoy it” (P10)

“My life experience tells me that rewarding people with money is a complete waste of time. You get to a certain level of income, that once you’ve got to that level, the extra £100 there is irrelevant. And it doesn’t motivate what you do.”
(P1)

and,

“I’m not that money motivated because I’m not starving or anything” (P7)

One participant did express a desire to be financially rewarded for her hard work, for which she had never been rewarded, saying,

“When we bid for work we put in an hours based bid and I think we should be paid accordingly” and also commented “...I do think that if you are doing

commercial work that they are charging you out on that you should get that money” (P9)

Her desire to be financially rewarded was rooted in the lack of time she has within her working day to complete research papers and publications. She found herself having to take holidays so she could write up papers, in a sense then the financial rewards were merely compensation for the use of her own time. Throughout the interview she was appreciative of the opportunity to engage with industry on KTPs, was enthusiastic and had enjoyed working with her project team. The potential for financial reward would therefore be less controlling because it would be administered in an autonomy-supportive environment

“...in which managers are able to take employees' perspectives, provide greater choice, and encourage self-initiation” (Gagne & Deci, 2005, p. 355)

She displayed an autonomous causality orientation as a result of her intrinsic motivation and self determination, and would be more likely to view such rewards as informational and supportive.

Where rewards are unexpected, or not regarded as important, there will be no negative effect on intrinsic motivation. Participant 14 thought recognition for KTP engagement should become part of the organisational culture, and gave positive feedback and recognition as an example of this type of reward. These are said to enhance intrinsic motivation. Participant 14 gave his own example of how he used to do this within his company, and believed that if you gave people recognition it could be a positive experience for all involved,

“...academia is like business – many people are not valued and they don't feel valued so if you can provide an opportunity for them to get recognition you know you never need to think about payback - you always get more back than you ever predicted” (P14)

Examples of this occurring during the participants engagement activity are detailed below. Participant 8, for example, commented:

“Well the feedback we had from the Company was positive” (P8)

and when asked how it felt motivationally he commented:

“...it was a shared feeling of being involved in something that worked well for the School. And a sense of ‘This is a good experience. We should roll this out again’” (P8)

Participant 4 also shared a similar story:

“What I liked at the end was that we said to the Managing Director, ‘Ok, we’ve finished the project. What’s it meant to you?’ and she said, ‘Well it’s done everything it’s meant to’ – that was when we had just finished the project. It was a year later down the line that we knew it meant a lot more” (P4)

Both participants felt appreciated and recognised by the Company and in an autonomy-supportive environment, where competencies were shared through both the development of the project and associated research, the need for relatedness was also met. It would then be possible for the participants to internalise their behaviour with regard to autonomous action, meaning that it would be more integrated, although still extrinsic. The consequence of this would be more affective behaviour and optimal development and well being.

5.5.7 Barriers

Academics engaging in KTP activity found that the process did not always run smoothly, and this caused barriers and challenges to individual motivation. These will be discussed below and the following table provides a summary of the issues.

| BARRIERS TO MOTIVATION |
|--|
| Issues with being able to publish (P2) / having time to publish (P9) |
| KTP engagement not helping career progression (P9) / Rhetoric of career progression (P1) |

| |
|--|
| BARRIERS TO MOTIVATION |
| University risk averse (P7) / expensive (P15) / slow (P7, P11) / bureaucratic (P1) |
| KTP approval process slow and bureaucratic (P3, P4, P5, P11) |
| Managing relationships between Associate and Company (P2, P3) |
| Company unwilling to fully participate (P2, P9) |

Table 30 - Barriers to motivation, as related to Knowledge Transfer Partnership engagement

5.5.7.1 Academic reputation

In the main, academics were able to be rewarded for their engagement, because the activity resulted in publication opportunities. For two participants though, this was not the case. For Participant 9 engagement in KTP projects had prevented her from being able to write up and publish her findings. She recognised that it was something she needed to address, and wished there were financial rewards to enable her to buy more time. Participant 2 also had issues. She explained why she could not publish her findings,

“...Er, no...because of the IP. It’s one of the shortcomings of the type of industry I am in. The commercial value of IP prevents me from being able to publish. (P2)

And later commented,

“In London the industry is incredibly competitive. It is frustrating you know? You can’t publish, not even in trade magazines. A mere mention and...” (P2)

She had tried to write case studies, but on three occasions she has been denied the opportunity, because there was too much for the company to lose. Rappert, (1999) discuss some of the challenges relating to knowledge transfer / exchange and Intellectual Property (IP) and suggested that some companies prefer internal measures such as people control, whereas others prefer the controlled use of knowledge. The latter appeared to be what the KTP company preferred. This block on publications was

frustrating, rather than de-motivating, but the academic acknowledged that it had an affect on her career and as a consequence she sought to make changes,

“...I’m gonna start some research which I will start, the IP will belong to us, and then I will go and find industry who I feel this may benefit. So I am going to do it jointly” (P2)

On the whole she was frustrated, and possibly de-motivated, by academia and where publications could have been an external reward, not having published had a direct consequence on her career which was quite controlling of her motivation

5.5.7.2 Career

Other academics commented that KTP engagement did not always have a positive effect on their career. Participant 15 said, “It doesn’t help, not in academic career terms” (P15). Participant 1, who did not have a doctorate, commented, “...what I find frustrating at times is that there’s a rhetoric that says you can progress through the Organisation...” (P1) but this was not necessarily clear to him as it appeared progression was still judged on the number of REF-able papers an academic produced. He felt he might qualify for a teaching route, but, “...there’s a Professor who’s gone through the teaching route but that Professor writes about teaching so it’s still a research route. It’s not a teaching route” (P1). He said that recently there had been a meeting where the Pro Vice Chancellor discussed progression via a business engagement route. This for him “...was quite interesting” (C1) and more relevant to activity like enterprise and KTP activity.

5.5.7.3 Administration and bureaucracy

The administration of KTPs, and the relationships formed and managed within the project in some cases caused the academics involved to be less motivated. For example, universities were regarded as “risk averse” (P7), expensive (P15), slow to sign off projects (P7 & 11) and extremely bureaucratic (P1) which caused one academic to suggest,

“I’m of the opinion that a lot of the admin systems are there to stop innovation and not encourage it” (P1)

5.5.7.4 Approval process

In the Regeneris' (2010) review, the application and approval process for KTPs was criticised as being too time consuming and bureaucratic, and this was confirmed in this set of interviews. Participant 3 found that,

“...the bureaucracy involved in getting these KTPs approved...the forms change every couple of years because the Government brings in new people to manage the programme and the first things these guys tend to do is develop new forms...and I'm not really sure they understand anything about business” (P3)

Participant 3 was frustrated as it acted as barrier with regards to his motivation to transfer knowledge. Later he also questioned the effect it might have on the motivation of others,

“...if you have to get used to doing the application in one form and then the next KTP you are putting through there's a new form...And that can be a de-motivating factor because you say, 'Why should I bother?'" (P3)

Participant 5 agreed and commented,

“I think the challenges are bureaucracy. That is a big challenge we have and it's getting worse...if you are not really very well motivated it will kill it” (P5)

These barriers and challenges could have had a detrimental effect on motivation if the individual was more inclined to be controlled by external rewards. The participants interviewed were generally intrinsically interested in the KTP projects, and found them meaningful, so the de-motivators were less strong. SDT considers motivation in terms of intrinsic, extrinsic and amotivation and in this case there was still evidence of intrinsic and extrinsic motivation so amotivation was not in evidence. Amotivation suggests there is no intrinsic or extrinsic motivation, or interest in either the activity or the rewards offered, which is incorrect in the case of KTP activity.

Sometimes projects took a while to be approved and this caused difficulties, especially when the company expected a faster response both from the academic and the university. Participants 4 and 11, both experienced at KTP engagements, provided examples of when they struggled to deliver projects quickly enough to meet industry deadlines. Participant 4 gave an example of where a KTP failed to be approved in time and he had to seek an alternative solution so as to preserve the relationship with the company. As an experienced academic he had the social networks which enabled him to collaborate with an ex-student in order to deliver the project to the company. The university lost vital revenue because its time-scales were incapable of matching its industrial partner.

Participant 11 documented an example of a KTP that had taken nearly two years to reach the stage where it could be approved. There were problems associated with appointing an Associate, when advertisements had not reached the correct target market and work visas were delayed. Only as a result of the commitment of the academic and the company did the KTP succeed. It had "...got to the stage where they'd nearly pulled out" (P11), but his knowledge, experience, and enthusiasm persuaded the company to continue, and a successful KTP was created.

5.5.7.5 Personalities

Where personalities gelled together relationships were harmonious and KTPs tended to be successful. Participants commented on how well they collaborated with other academics, how they enjoyed supporting their Associate, and how they formed working relationships with companies which then continued into the future. Unfortunately, when relationships began to fail, motivation changed, and KTPs became stressful. In some cases the relationship between the Associate and the company was strained and the academic needed to intervene. Participant 3 had to "engage heavily" when his Associate was found to be lacking experience when working with the Managing Director and the senior managers in a company. Participant 3 did not want to take this action as he preferred to have a clear definition between his role and the Associate / Company relationship, but he intervened in order to ensure the project would be successful. His motivation was more controlled and focused on protecting his reputation and that of his university, as well as maintaining the relationship between him and the company, and the university and the company. It was not an example of

amotivation though because he still expressed a degree of motivation, introjected motivation specifically, towards protecting reputations.

Participant 2 also had problems with her Associate and the Company, and the different personalities had the potential to affect the success of the project. She explained that,

“...I would not want to control a KTP because that goes against the grain...I had to do a lot of fire-fighting, I had to do a lot of risk assessment, and also be a shoulder to cry on” (P2)

In her eyes the KTP was “difficult because of the Associate” (P2). “A KTP is dependent on the Associate” but he was not very “pro-active” (P2). He was hard working, but despite this the Company “...bullied him. Quite dramatically” (P2) because “...he was quite weak in his person...he was not a leader” (P2). The participant found that overall this was a stressful KTP. Relationships in general were not easy, which was evident when she described the people in the company as “very strange people” (P2). Having to step in to help the Associate went against the way the academic preferred to work, and therefore her motivation was more controlled by external contingencies. Like Participant 3 she was no doubt concerned about the success of the project, and the reputation of the individuals involved, and therefore intervened. Her intrinsic and extrinsic motivations were again sufficiently in evidence so to describe her motivation as amotivation would surely be wrong.

5.5.7.6 Engaging with the company

There were also issues concerning the manner in which companies worked with the academics. Participant 9 resolved the problems eventually, but, at the beginning found that the company was unwilling to fully participate in joint community events, and did not feel it necessary even to send a token representative. Participant 2 also had problems. Alongside dealing with the difficult relationship between the Associate and company, she felt that the company did not appreciate her efforts. She saw them as unwilling to recognise her efforts, as unwilling to change their approach, and dismissive of the solutions she offered. Both academics remained engaged because they were interested in the intellectual challenge, and because it was meaningful to them to work with industry. Therefore the behaviour of the academic can not be described as

amotivated because she was still keen to engage. Despite being stressful, for Participant 2 it was an opportunity to get back into industry. She found that she missed this environment and it motivated her, along with a decline in interest in academia, to send her CV to recruitment consultancies.

5.6 CONCLUSION

The purpose of the chapter was to identify and discuss intrinsic and extrinsic motivators for academics engaging in KTP activity. A series of barriers, which will be dealt with in greater detail in the Discussion chapter which follows were also identified. The intrinsic and extrinsic motivators were considered in relation to SDT, a theory of motivation which also encourages consideration of the effects the social environment can have on the individual. For this reason SDT was felt to be an appropriate theoretical position to consider.

Clearly a love of knowledge and research, and a desire to engage in novel projects, and seek solutions to problems, provide academics with the intrinsic motivation they need. Both academia and KTP engagement with those interviewed were extrinsically motivated by a desire to work in partnership with others in order to share knowledge and enhance understanding. In addition they were motivated to make a difference, in order to improve the capacity of the company, and support learning for their students. Other controlled behaviour is in evidence, for example the connection between research and publication. Academic esteem and reputation depends on publications, so in a sense, the academic might very well be interested in publishing as they also know the benefit it will have on their career, and on the reputation of their Department and University.

With reputation and esteem being important drivers for academic careers, those who struggled to publish as a result of the time spent on KTP and engaged research, or because they had followed less traditional academic routes and had yet to obtain a doctorate, felt that they were undervalued by their universities and by the academic community. This was a barrier to motivation, and was related to the ability of engaged academics to progress through more traditional career structures. In addition levels of bureaucracy, which made the processes slower than some had hoped, were barriers specifically related to the KTP process.

As has been suggested previously SDT uses the term amotivation to describe behaviour that is neither intrinsically nor extrinsically motivated. For the purposes of this research it has been more fitting to describe those incidences that challenge motivation as barriers to motivation. This is because the academics remain intrinsically and extrinsically motivated by opportunities to engage in KTP activity.

The figure overleaf (Figure 17) summarises the data collected from the interviews. The complex role, as well as the motivation of the academic engaging in KTP activity, is highlighted by the connections between university / department and KTP and individual. The data analysis proves that the motivations intersect, but are not as clear cut as the diagram might suggest. The discussion chapter will review how best to take advantage of these relationships, to the benefit of the individual, and the environments in which they work.

HIGHER EDUCATION POLICY EUROPE / UK

UNIVERSITY

- *Connection to research
- *Revenue for university / repeat business
- *Appreciative of KTP office
- *Wrong place – financial motivation
- *Financial rewards

DEPARTMENT

- *Working with experienced colleagues
- *Teaching & curriculum development
- *Academia more than teaching & learning
- *Academic reputation

KTPs

- *“real” engagement – different sense of world / “straddle two worlds”
- *“due diligence” / “engaged scholarship”
- *Build capacity / make difference to company /
- *company use & value knowledge / generate value
- *Engaging with individuals with common interest
- *Being visible to company
- *Working in a team
- *Manage expectations
- *Keeping in touch with industry
- * Learning what it meant to be part of a company
- *Advising the company
- *Happy clients

INDIVIDUAL MOTIVATION

- *Developing ideas through discourse
- *Drawing on skills base / applying knowledge
- *Acquiring new knowledge / developing new techniques / new research projects / developing new insights
- *Mentoring role
- *Being proactive
- *Doing better
- *Not financially motivated
- *Academic reputation

- *KTP approval process slow & bureaucratic*
- *Managing relationships between company & Associate*
- *Company unwilling to fully participate*
- *KTP not good for career progression*

- *Issues with being able to publish / time to publish*
- *Rhetoric of career progression*
- *University slow / risk averse / bureaucratic / expensive*

6 - Discussion

6.1 INTRODUCTION

The previous chapter concluded by suggesting that there was a variety of motivations, intrinsic and extrinsic, which steered the behaviour of academics engaging in Knowledge Transfer Partnership (KTP) activity. It did this by reflecting on the findings from the semi-structured interviews and evaluating this data through the lens of Self Determination Theory (SDT).

The purpose of this chapter is to bring together the findings from the literature review and data analysis, in order to

- understand why the academic is attracted to, and motivated by, involvement in KTP activity;
- evaluate the intrinsic and extrinsic motivators for KTP activity, and understand the barriers to motivation;
- provide a series of recommendations which build upon the benefits, and address the barriers to motivation, for the purpose of making engagement more motivating for the academic, and to ensure more successful collaborations for universities

The chapter concludes by discussing some of the implications of using SDT for KTP activity, and interrogates the methodological issues to understand how this study has contributed to theory testing and theory development.

6.2 KNOWLEDGE TRANSFER PARTNERSHIPS AND MOTIVATION

As stated in the introduction, part of the purpose of this chapter is to identify what is important for instigating and maintaining individual motivation with regard to KTP engagement. These factors are identified in the following sections leading to recommendations which build from the positives, and address the difficulties surrounding engagement in KTP activity. These recommendations are addressed at a range of levels: higher education policy, university, department, KTP project, and individual and summarised in Figure 17. They are intended to contribute to the debate

about the creation of stimulating, motivating engagements with industry.

6.2.1 Evidence from the literature reviews

The intrinsic and extrinsic motivations, and barriers to motivation for engagement in knowledge transfer activities, as identified in the literature review, are again listed.

| INTRINSIC MOTIVATION | EXTRINSIC MOTIVATION |
|---|--|
| Complements traditional academic norms – enhances feelings of competency | Complements traditional academic norms – activity aligned to teaching and research |
| Intrinsic value of activity – interested in the activity | Pursue activity for purposes of research commercialisation |
| Boundary spanning individual – enjoys connecting between academic and business world | Past experience – ethos of where academic trained can act as extrinsic motivator |
| Feeling competent to communicate in a language understood by all parties – reduces barriers to engagement | Head of Department committed academic entrepreneur |
| Gaining new knowledge and insight – naturally curious | Professional imprinting – early stage of academic career |
| Desire to contribute | Prior experience – builds social capital |
| Autonomy to set own goals and targets | Prior experience – access to social networks to provide opportunities for involvement in enterprise activity |
| Finding new ways of working from feedback from industry | Support from Technology Transfer Offices – to understand motivations and intentions of all parties and ensure knowledge is produced and shared to the benefit of all |
| Novelty of new research projects and | Successful projects due to self-selection of |

| INTRINSIC MOTIVATION | EXTRINSIC MOTIVATION |
|-----------------------------|--|
| applications for technology | projects where there are higher returns |
| | Successful projects which are self-selected means that academic reputations are protected |
| | Good academic reputation will lead to academic winning further research grants |
| | Gaining feedback from industry – in future can apply new ways of working to benefit of all |

| BARRIERS TO MOTIVATION |
|---|
| Fear it will restrict academic freedom |
| Effect of localised social norms – working environment which is not supportive of academic entrepreneurialism |
| Cultures of different organisations – do not develop language for effective knowledge transmission |
| Pressure to meet financial objectives – barrier to producing academic publications |
| Secrecy of knowledge transfer activity – barrier to producing academic publications |
| Removal of financial rewards – academics involved in knowledge transfer only because it might enhance academic status |

Table 31 - Intrinsic and extrinsic motivators, and barriers to motivation – literature review

The purpose of the following sections is to compare findings from the literature review to findings from the research study, in order to understand the extent to which the motivational benefits of KTPs are similar to, or different from, other third stream activity, particularly research commercialisation and patenting. It will then be possible to come

to some conclusions about the conditions that dictate the extent to which an individual is motivated by knowledge transfer. This knowledge can then be used to develop guidelines to assist universities in an understanding of how how to keep their academics motivated when engaging in knowledge transfer.

6.2.2 Evidence from the data analysis

The tables below present the findings from the data analysis of KTP engagement.

| INTRINSIC MOTIVATORS | EXTRINSIC MOTIVATORS |
|--|---|
| Developing ideas through discourse | Engaging with individuals with common interests |
| Drawing on skill base | Being visible to Company |
| Applying knowledge | Working in team |
| Acquiring new knowledge / Develop new techniques / Novelty | Working with experienced colleagues |
| 'Real' engagement providing different sense of world | Mentoring role |
| Connection to research | Appreciative of KTP office |
| Advising the company | Being proactive |
| Developing new insights | "Due diligence" / "Engaged scholarship" |
| New research projects | Manage expectations |
| Learning what it meant to be part of a company | Doing better |
| "Straddle two worlds" | Build capacity |
| Keep in touch with industry | Making a difference to the company |
| | Company using and valuing knowledge |
| | Generating value for the company |
| | Generating additional revenue for the |

| INTRINSIC MOTIVATORS | EXTRINSIC MOTIVATORS |
|----------------------|--|
| | university |
| | Repeat business for the university |
| | Not financially motivated / wrong place for financial rewards |
| | Extra payments / Financial rewards |
| | Positive feedback / Awards |
| | “Happy clients” |
| | Academic reputation |
| | Teaching & curriculum development / Shows academia to be more than teaching & learning |
| | Working with experienced academics |

| BARRIERS TO MOTIVATION |
|--|
| Issues surrounding the ability to publish / having time to publish |
| KTP engagement not helping career progression / Rhetoric of career progression |
| University risk averse / expensive / slow / bureaucratic |
| KTP approval process slow and bureaucratic |
| Managing relationships between Associate and Company |
| Company unwilling to fully participate |

Table 32 - Intrinsic and extrinsic motivators, and barriers to motivation – data analysis

In spite of the different focus for knowledge transfer, when comparing KTP, research collaborations and patenting, there are a number of common themes. The goal is to transfer knowledge to industry and this requires a certain type of academic, as well as

the sharing of an appropriate ethos and similar experience.

What follows is an exploration of the motivations. Recommendations are then offered in order to demonstrate how the motivation might be enhanced even further, for the benefit of academic, project, university and society.

6.2.3 Intrinsic and extrinsic motivators

The purpose of this section is to explore intrinsic and extrinsic motivations. Before doing so a few moments is taken to reflect on how the Researcher applied her understanding of intrinsic motivation to the data analysis.

6.2.3.1 Adaptations to definitions of intrinsic motivation

The Motivation Continuum provided by SDT and used in this study as a means by which to organise and analyse excerpts of interview data can be criticised for not allowing representation of different types of intrinsic motivation. As SDT stands it differentiates between levels of extrinsic motivation, but does not afford the same differentiation for intrinsic motivation or amotivation. Locke and Latham, who are critical of SDT, considered the effects of goals on intrinsic motivation and argued that SDT failed to distinguish between liking an activity for its own sake and liking it for the inherent feelings of competency (Locke & Latham, 1990, p. 55). For intrinsic motivation if basic needs are met and then an individual will be intrinsically motivated. When analysing the interview data it was clear that intrinsically motivated behaviour could be represented as being either related to feelings of competency, autonomy or relatedness. In order to manage these differences what in fact the Researcher did was when organising her data for writing-up the analysis she considered how data excerpts best fitted in terms of being related to autonomous, competent and related behaviour. She felt that feelings and incidences of competency and autonomy fed into meeting the basic need of relatedness. SDT theorists argue that autonomy and relatedness are not antagonistic, and individuals need to feel competent and autonomous if they are to feel intrinsically motivated. In practical terms the Researcher found that arranging her findings in terms of incidences of competency, autonomy and relatedness made for a more manageable write-up of the research data. The following figure (Figure 18) represents the relationship between the basic needs as the Researcher perceived it and Appendix 4 shows how it was enacted in practical terms.

This was a clear incidence of Researcher meaning making. In order for the Researcher to be able to make interpretations for the Reader she had to be able to acknowledge the values, definitions, and her perspectives on the reality as she saw it. She was then able to use linguistic categories to determine what interpretations she had made, in order to be able to share this learning, or “perspective transformation” (Krauss, 2005, p. 763) with the Reader.

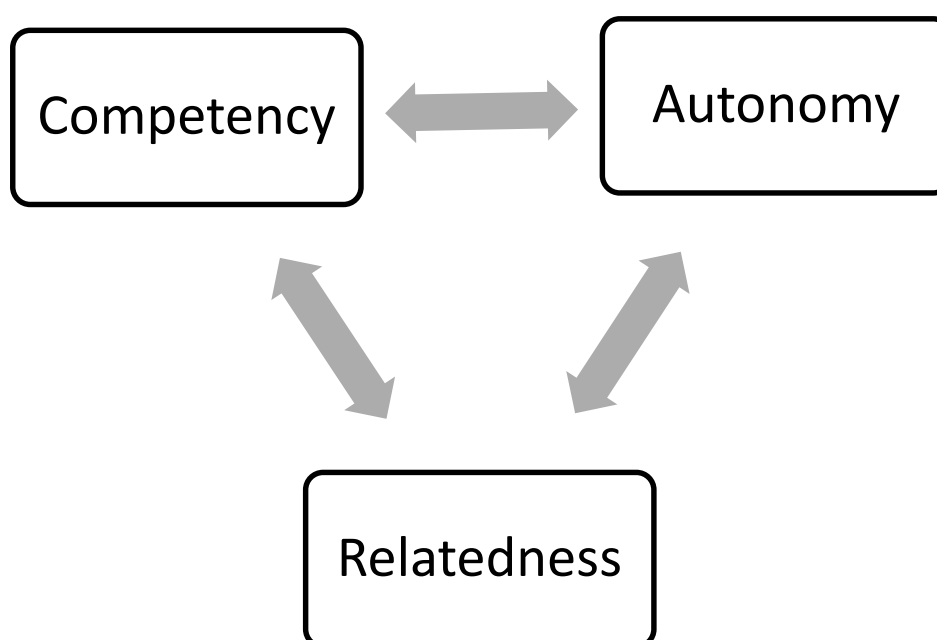


Figure 18 - Organising intrinsic motivation data

On reflection the Researcher realises she could have built on the Motivation Continuum as Vallerand et al (1992) have done. In 1975 Deci proposed that intrinsic motivation could be differentiated into more specific motives, but provided no further evidence of what these could be. In 1992 Vallerand et al conducted their own research which endorsed the SDT theory but also proposed a tripartite taxonomy of intrinsic motivation as shown in Figure 19

| TYPE OF INTRINSIC MOTIVATION | IM-to know | IM-to accomplish | IM- to experience stimulation |
|-------------------------------------|--|---|---|
| DEFINITION | Relates to exploration, curiosity, learning goals, intrinsic | Related to mastery motivation and feeling competent | Related to sensory pleasure, fun and excitement |

| | | | |
|--|--|---|--|
| | intellectuality, IM to learn Defined as performing an activity for the pleasure and the satisfaction that one experiences when learning | Defined as engaging in activity for the pleasure and satisfaction experienced when one attempts to accomplish or create something | Defined as when someone engages in an activity in order to experience stimulating sensations |
|--|--|---|--|

Figure 19 - Tripartite taxonomy of intrinsic motivation (Vallerand et al., 1992)

Whilst the Researcher recognises the merit in these specific motives, in the case of individual motivation and KTP engagement it would be more appropriate to consider intrinsic motivation in terms of competency, autonomy, and relatedness. Clear examples of IM-to know could be seen in the interview data, as could IM-to accomplish. IM-to experience stimulation was more difficult to determine although there were incidences where behaviours were referred to as being fun or there was “love of” knowledge and learning, for example. The Researcher does feel that Vallerand et al (1992) definitions did not extend sufficiently to include relatedness. If an academic is to feel connected to those s/he engages with this is going to promote internalisation of behaviour and intrinsic motivation. Without meeting the need for relatedness, the academic is not, in SDT terms, intrinsically motivated.

6.2.3.1 Motivated by a love of knowledge and learning

SDT describes intrinsic motivation as “...doing something for its own sake, out of interest and enjoyment” (Gagné & Deci, 2014, p. 1). Comparing the data analysis with the literature review it is clear how important it is for an academic to have a love of knowledge, and be interested in the activity of transferring, sharing, exchanging, creating and exploring knowledge. The intrinsic value of the activity is important for motivation. A love of knowledge and learning encompasses being curious and wanting to offer the opportunity to intellectualise, to ask questions, and to gain new insights and new ways of thinking. It would be fair to say that a traditional academic career provides similar opportunities to gain and transmit new knowledge. The fact that these motivators compliment traditional academic norms should be reassuring for someone deliberating on whether or not to engage in a KTP.

6.2.3.3 Engaging in knowledge transfer yields feelings of competency

The literature review concluded that engaging in knowledge transfer activity complimented traditional academic norms because it enhanced feelings of competency. Competence is a basic psychological need, and a key aspect of positive motivation according to SDT. SDT defines competence as the need for a sense of proficiency and feelings of effectiveness in one's work (Deci, 1975; Ryan and Deci, 2002 cited in Gilbert & Kelloway, 2014, p. 183). KTP activity provides opportunities for academics to become proficient in an area of work which is of interest to them. Using their intrinsic interest they collaborate with the company to develop a mutually beneficial project. The academic already has knowledge of the research area with the KTP offering an opportunity to extend their knowledge, and thereby their competence in the subject. Their need for competence is addressed by challenging currently held knowledge for example and sharing this new knowledge with the company. Likewise they develop proficiency from opportunities which allow them to share their knowledge. Here they will be questioned, asked for explanations, as well as being requested to provide evidence for their findings. These opportunities enable the academic to reflect and comment on their learning, and relate their findings to the Company in a manner in which the Company can benefit from the knowledge gained.

6.2.3.4 Engaging in knowledge transfer promotes opportunities to act

autonomously

KTP activity enables academics opportunities to apply theory to new areas of knowledge and, as a consequence, develop and test theory. Academics need to have the freedom and autonomy to do this if it is to remain intrinsically interesting and they are to work effectively on the KTP. As Ryan and Deci suggest, if an opportunity to engage in challenging tasks is provided, and these tasks allow the individual to explore and build on their skill base and knowledge as well as develop new skills, then an individual is more likely to feel competent (Ryan and Deci, 2002 cited in Gilbert & Kelloway, 2014, p. 183). According to SDT the extent to which an individual feels that their intrinsic needs are being satisfied by their work is dependent on how they perceive the actions of their managers. If, for example, KTP engagement provides academics with the opportunity to explore their discipline with a strong degree of autonomy, then it satisfies their intrinsic interest and innate curiosity. Furthermore, it was found that those individuals with a high autonomy orientation were more likely to view their managers as supportive, rather than controlling, of their actions and were more likely to want to participate in activity which supported their own self-regulation. In other words they were more likely to seek out opportunities where they could work independently and act autonomously (Baard et al., 2004 cited in Gilbert & Kelloway, 2014, p. 182). Opportunities to engage in KTP activity are supportive of the traditional norm of academic freedom because, to a large extent, the academic can act independently, and this should appeal to those academics with a high autonomy orientation.

6.2.3.5 Engaging in knowledge transfer supports the need to belong

There are also social aspects of KTP activity which academics found intrinsically motivating. These relate to the contribution they are making to society, and the way in which their boundary-spanning role enables them to communicate with both the academic and business worlds. These activities fulfil the basic psychological need of relatedness, and they are interested in forming relationships which are interesting and enjoyable. Gilbert and Kelloway suggest more empirical evidence is needed to understand the relationship between relatedness and intrinsic motivation but cite behavioural examples such as shared group goals, mutual respect, effective communication and sharing information, as ways of supporting relatedness (Gilbert & Kelloway, 2014, p. 183). According to Ryan and Deci, relatedness is about

connectedness, belonging and interdependency with others or a group (Ryan and Deci, 2002 cited in Gilbert & Kelloway, 2014, p. 183). It is quite possible that believing that the KTP activity is making a difference to society – be it on a smaller scale for the company, the Associate, the University, or in a wider sense, for society – meets the basic psychological need for relatedness because it promotes belonging and connectedness to others. Additionally, because the academic is the conduit between the company and the university, they gain experience in communicating in a language which everyone understands. They might already have experience of working in the field in which they are interested and enjoy and the KTP will therefore confirm their competency communicating with business. If acting in a boundary spanning role is something that interests them, because it supports their basic psychological needs of relatedness and competence, it is intrinsically motivating.

6.2.3.6 Tangible rewards do not motivate

SDT describes extrinsic motivation as “...the doing of an action that is not interesting and enjoyable to get a separate consequence” (Gagné & Deci, 2014, p. 3) but it must be understood that extrinsic motivation varies in the degree to which the action can be internalised. Classic instances of extrinsic motivation result in rewards, and are the least autonomous, whereas when the individual can identify with the action they perceive to be in keeping with their personal values or self-selected goals, it follows that this is the most internalised version of extrinsically motivated behaviour. In general, evidence from the literature review and the data analysis conclude that academics are generally not externally regulated. They are not motivated solely by those rewards which offer a financial incentive. Nonetheless some KTP academics appreciate financial payments which can aid personal development and attendance at conferences and, as such, can have a motivational value even if receiving them is not congruent with overall extrinsic motivation of the most autonomous, internalised type. Lam's 2010 study found similar results with some of the “elite” academics she interviewed, particularly with “traditionalists.” These academics engaged in research commercialisation to support their work and reputation, but they expressed a reluctance to commercialise their research because it caused them personal conflict.

6.2.3.7 Knowledge transfer promotes feelings of relatedness to industry

One of the key extrinsic motivators for academics engaging in knowledge transfer is a

desire to engage with industry and business. What seems to motivate them is their past experience and professional imprinting. Dietz and Bozeman (2005) maintain that prior experience builds social capital and provides the social networks needed for boundary spanning individuals to communicate within the cultures of different organisations. This also applied to KTP academics because, for the most part, they also are academics who have prior experience of engagement with industry. This might have taken place as a student or in positions they worked in prior to entering academia. Here some of the more experienced academics also have roles chairing national bodies which represent and connect academia with industry. Central to these relationships is the sense of relatedness they get from the engagements. Experience enables the academics to feel they belong not only to academia, but also to the industry in which they previously worked. KTP engagement provides further opportunities to build on and share knowledge, which supports their need for competence. This activity is one form of the most autonomously motivated extrinsic behaviour. They find the activity personally valuable but also something they value, and the KTP provides them with opportunities to self-select their goals. Whilst they might be intrinsically motivated and enjoy the opportunity of communicating with industry, there is also a separate consequence. Using one's experience to respond to the call for KTPs, and applying experience to develop a project, and meeting project goals are actions with which they identify, but which are extrinsically controlled.

6.2.3.8 Engaging in knowledge transfer is complimentary to traditional academic norms

Another important extrinsic motivator for engaging in knowledge transfer with business and industry is that it compliments traditional academic norms and tends to have a positive effect on reputation. Lam (2010), for example, found examples of academics who were more extrinsically motivated by the 'ribbon' (reputation) than by the 'gold' (financial rewards). These academics used their engagement in commercial activities to generate resources for their research and to meet personal professional goals such as publishing and attending conferences, both of which affect their reputation and are traditional academic norms. Lacetera (2005) also found that academics self-select projects because of the likelihood of high returns such as being able to publish their research or gain additional funding. This suggests that for academics having academic freedom and to a large extent, the autonomy to select the projects on which they wish

to work, is actually motivationally important. In SDT terms it provides opportunities to develop competencies in traditional academic areas such as research and publication, which in turn means that the academic has a sense of belonging to their peer group. The similar extrinsic motivators apply to KTP academics who are motivated by opportunities to produce research publications, and opportunities to engage in projects which contribute to their personal reputation and that of their school, department or university. They understand that successful KTP projects ensure that their personal reputation improves. This could lead to opportunities for further collaborations, which support the mission of the university to transfer knowledge, and might eventually lead to income generation for the university.

6.2.3.9 Engaging in knowledge transfer provides opportunities to connect research to teaching and learning

For KTP academics there are further extrinsic motivators which compliment traditional academic norms. These include the connection to teaching and learning. For many of those interviewed, being able to connect the learning from the KTP to the teaching in the classroom is a key motivator. Interestingly this, as an extrinsic motivator, did not feature in the papers read for the literature review, and therefore is one of the unique features of KTP engagement. This action can be internalised by the individual because it meets with their personal values, and is engaged in as autonomously as possible, within the constraints of the university system. A love of sharing knowledge is intrinsically motivating, but also extrinsically rewarding when, as a result, students develop. These “rewards” from teaching and sharing knowledge confirm a sense of personal competency, but also confirm a belonging and connectedness to the academic body. It also coincides with a desire to support their Associate, suggesting that this sense of belonging and connectedness, having shared goals and mutual respect, is hugely motivational.

6.2.3.10 Engaging in knowledge transfer facilitates networking opportunities

A sense of relatedness to the people or group is important if collaborations are to be successful and knowledge is to be shared (Wang & Noe, 2010). The literature review found that prior experience ensured access to networks in order to share and develop knowledge. Whilst the usefulness of prior experience for networking was not referred to in relation to KTP engagement, for many engaging in KTP activity did lead to

networking opportunities as well as to long term relationships with companies. The need for relatedness was also satisfied because KTP participants felt extrinsically motivated by their ability to enter into a discourse in order to develop new projects as a result of new knowledge gained. Gaining these softer skills is motivationally important, especially if the aim is to be able to engage in future KTP activity. These skills contribute to a sense of competence because the academic is able to harness their knowledge and share it in an effective manner. Thus the action which they personally value is integrated because they are able to perform it with a reasonably high level of autonomy.

6.2.3.11 Motivated by the opportunity to support the development of Associate and company

For KTPs being able to support the personal development of the Associate was also an important extrinsic motivator. This action is able to be integrated because it is something of value and, is, in a sense, aligned to their more traditional role as teacher. As the Associate grows into the role, and as they are given increasingly challenging tasks, their sense of competence will grow. The academic will have to guide the Associate through this learning process, and because this action, as well as engaging in the project generally, might challenge their understanding they will also increase their competency. Collaboration will also contribute to a sense of relatedness to each other and the project group as a whole, which will be extrinsically motivating. The Associate will also be supported by the university's KTP office ; academics generally expressed gratitude about the level of help they received from the office in respect to this, as well as the help they received in relation to developing the KTP process.

Academics also find it motivational when the companies responded positively to their interventions. KTP academics are extrinsically motivated especially when they feel their contributions are recognised and when they see the company using and valuing their collaboration. This addresses their need for competence because the company is able to make use of their intellectual input, and because the academic has collaborated with the company and Associate to develop the project, it meets their need for connectedness and belonging. As academics engaged in activity that they personally valued and recognised, this action was integrated into their behaviour and is therefore, an example of the least controlled extrinsic motivation.

6.2.4 Barriers to motivation

6.2.4.1 SDT and amotivation

In addition to intrinsic and extrinsic motivation SDT theorists use the term amotivation to describe when individuals are neither intrinsically nor extrinsically motivated (Vallerand et al., 1992, p. 1007). Here, individuals feel situations are out of their control and they are not able to rectify the problems. Their behaviour is out of their control and they feel no longer able to participate in activities. Amotivation, it is argued, is different in definition to what has been named “barriers to motivation” in this research study. During analysis of the interview data the Researcher recognised that some events and experiences frustrated the individuals involved; in other words they acted as barriers to their motivation. Their intrinsic and extrinsic motivation was high but they recognised that there were issues in the work environment which may effect their engagement. To say they felt out of control and unable to rectify their problems may perhaps be too strong a statement and therefore there is a subtle difference between amotivation and barriers to motivation.

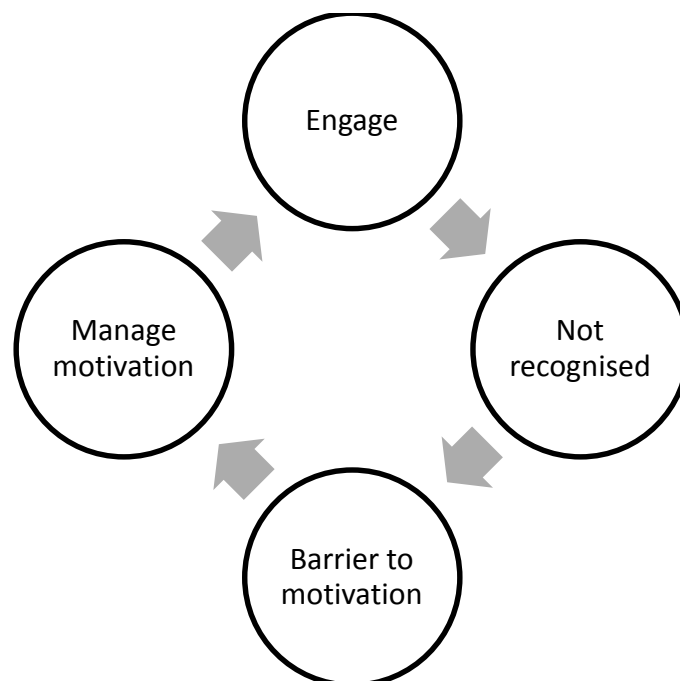


Figure 20 - Barrier to motivation cycle

Individual academics wanted to engage in KTP activity but because they felt they were not sufficiently recognised – be it in terms of other academics failing to value their work

because they were not Doctoral qualified, or their university failed to recognise their engagement activity as part of their career progression – it created a barrier to motivation. Consequently they had to manage their motivation but their intrinsic and most autonomous of their extrinsic motivation was sufficiently high that they remained engaged in the KTP process.

The reasons why academics are able to remain engaged could be related to their prior experiences. From this experience they have acquired sufficient knowledge and skills to enable them to find value from engagement, even if this value is not in terms of recognition. Having time to engage is obviously challenging but the academics appeared to be willing to make time because they enjoyed the connection back to the 'real world' of business. Having worked in the business world meant the majority did not find it difficult to network and build relations with their business partners.

Perhaps the academic environment and KTP engagement represents a unique work environment. The nature of academia means that "academic freedom" is highly valued and with that choice members of academia are able to act on their volition. This means that academics are able to make up their own minds about whether to engage in KTP activity or not. Of course academics are encouraged to engage in knowledge transfer – it benefits them as individual researchers and teachers, and there are benefits to the departments and faculties – but engagement is not specifically part of their job description.

6.2.4.2 Questions over the legitimacy of knowledge transfer as an academic activity

It appears that, whilst many academics embrace research commercialisation or KTP engagement as examples of knowledge transfer to business and industry, there are still question marks about its legitimacy as an activity which relates to the traditional role of the academic. The literature reviews pick up on fears that academic freedom will be restricted, but are not referred to in the data analysis. Here, instead the focus is put on pressures to submit research, on academic snobbery and on role overload. An explanation as to why there are differences in what is perceived to be a barrier, comes in the form of the differences between elite academics engaging in research commercialisation, and academics engaging in KTP activity, who in this research study,

were academics from newer universities. Lee (1996) suggests that individuals seek to engage in activity which matches their preconceptions and the focus of elite academics is on publishing research findings and on reputation management. They fear that a removal or reduction in academic freedom could result in being able to publish less research, and this might affect their scholarly reputation.

6.2.4.3 Balancing knowledge transfer activity with traditional academic activity

Academics in newer universities already face challenges because their timetables allow less time for research, and some find that engaging in a KTP compounds this. Some feel they experience role overload, especially as they have to manage the KTP alongside more traditional academic functions, and, with some, the membership of national bodies. In some cases this has an affect on motivation, particularly with regard to the need for competence. If academics are unable to undertake and publish research because they are spending time on KTP projects or other university matters such as administration, then they will increasingly feel they are unable to demonstrate their competence in the wider research community. If the working environment becomes increasingly busy, or increasingly controlled, then it could have an effect on the extent to which an academic will be able to enjoy or be interested in conducting and writing up research, meaning that their intrinsic motivation could wane.

6.2.4.3 Environments where support for enterprise is lacking fail to promote optimal well-being for entrepreneurially inclined academics

Academics engaged in research commercialisation found it challenging when their Department did not support their entrepreneurial inclinations. Bercovitz and Feldman (2008) found that academics will conform to localised social norms, so will fail to engage either substantively (by their actions) or symbolically (in spirit only). KTP academics did not consider that the same issues occurred but did suggest that some aspects of the university system made their engagement in KTP activity more difficult. As mentioned previously, academics at Russell Group universities have more time allocated to research and this was considered to be an unfair advantage by a number of the academics interviewed. They explained that because academics in newer universities are given insufficient time for research, it is difficult for them to compete on an equal footing. More specific to KTP engagement, academics commented on how the university was risk averse, expensive and bureaucratic when it came to enterprise

activity, that HE policy was prescriptive, and there was a general feeling of not being sufficiently recognised or appreciated for the efforts made to engage with business and industry. This ensures that academics are more cautious about whether or not to engage with business and industry for fear it may take too long or be lacking in financial viability, even after effort is put in to bring the company to the university. The effect on motivation from a more controlling environment might be such that individuals feel they have less choice about how they attract businesses, and might be less inclined to network to find new contacts because of a fear that their efforts will be of little use in the end. This then provides less opportunity for the academics to be able to demonstrate their competency in their subject area.

6.2.4.5 The administration and management of Knowledge Transfer Partnerships hinders motivation

The main de-motivating issues with regard to the administration of the scheme are the way some universities administer the projects, and the unrealistic time-scales the scheme adopts. Some universities operate a system whereby academics approach them with fully formed projects and contacts, and ask if they can put forward a KTP. Alternatively, a company will approach the university and the KTP office will seek an academic who might make a good match, and then they help to foster the relationship. This is what happened in the majority of cases, but in at least one university, the KTP office sought out companies willing to work on KTPs and subsequently found academics with a suitable background and then expected them to work together. For the academics who were engaged in these types of relationships there were questions over whether the company had been mis-sold the idea of a KTP, or whether the company actually understood what was involved. Again the academics involved were intrinsically motivated because they enjoyed the KTP relationship and were interested in the subject, but they did not necessarily feel a strong sense of connectedness and belonging to the project group. In SDT terms this was because the universities developed the relationship with the company, thus removing the autonomy in the formation of relationships, the sort of autonomy that is needed to create longer term successful relationships. Behaviour in this instance becomes more controlled, and whilst not entirely extrinsically regulated, it is perhaps more ego-involved and introjected.

6.2.4.6 Career progression is not always clear with regards academics with entrepreneurial inclinations

KTP engagement was also felt to affect career progression. Part of the issue relates to publications. If publications are a measure by which academics compare themselves to other academics, and a measure used by universities to measure whether an academic can progress to a more senior post, then being prevented from publishing because of IP issues makes it more difficult to use this as a measure of competition. Academics are therefore de-motivated by this element of KTP activity. Career progression is also affected by other factors. Some felt that they faced 'academic snobbery' as they did not have a Doctorate. They believed that universities value research above enterprise or teaching and this was the reason they, and others, were unable to make progress in their academic career. In the data analysed, other academics commented that to be an academic who engages in enterprise activity, means that they are likely to face challenges when it comes to career progression. Again, from the perspective of the academics interviewed, it appears that gender and experience can also have a negative effect on career progression, especially if the academic engages in KTP activity as well. There are, therefore, significant challenges with regards to career progression and perceptions of career progression from those engaging in enterprise and teaching activity. In the main however, they remained intrinsically motivated despite feeling increasingly controlled by an externally regulated reward.

6.3 RECOMMENDATIONS

The previous section detailed some of the intrinsic and extrinsic motivations for academics engaging in Knowledge Transfer, but also addressed some of the weaknesses in the process. In the following section a series of recommendations related to KTP engagement are prescribed which attempt to address the weaknesses, and build upon the motivating aspects. They are cited at higher education policy level, university and departmental level, as well as at KTP and individual levels, and summarised in Figure 17. The figure illustrates the interlinked nature of the levels. What happens in one level impacts on the other levels, and the individual academic, particularly, has to be responsive to the changes.

With regards to the composition of each level, this is summarised as follows:

6.3.1 Higher Education policy – Europe and UK

The recommendations for this level are aimed at policy makers in Europe and UK. In Europe the focus is on the European Community's innovation and higher education policies, whereas in UK the focus is on higher education policies made by government and government funded bodies. UK government funded bodies include HEFCE, because they are responsible for knowledge exchange funding and policies, and Innovate UK because of their responsibility for the KTP programme.

6.3.2 University and departmental level

These recommendations apply to individual universities and the departments within. The nature of the relationship between university and department means that often departmental processes will originate from the university management systems, in order to ensure that there is continuity across departments.

Where individual departments could be most effective is in their management of staff members and their knowledge of staff motivations. They could provide guidance to university managers about how processes could be designed to have the most positive effect on individual staff motivation.

6.3.3 Knowledge Transfer Partnership level

KTP activity is influenced by the policies set by government and particularly by Innovate UK which manages the process. Recommendations therefore relate to how best to improve the processes to ensure a motivational experience for the academics involved.

An actual KTP project also involves a partnership between academic, business, and Associate and the way in which these relationships develop is affected by the individuals involved. Whilst some relationships would always be more difficult, there is room for guidance and best practice to ensure effective relationships are formed which meet the motivational needs of all parties.

6.3.4 Individual motivation

This research study was interested in determining intrinsic and extrinsic motivators, and barriers to motivation for individual academics engaged in KTP activity. Only with their commitment to KTP activity are the partnerships and project a success. It is therefore important to consider the individual as part of any motivation strategy, but it is likely that it will be the department or university which will develop plans and processes by which to best employ the knowledge and experience of engaged academics.

**HIGHER EDUCATION POLICY
EUROPE / UK**

Greater consideration of how academic reputation is measured, is required, in order to address felt inequalities between research academics and industry engaged / third stream facing academics

UNIVERSITY

Consider formalising the University recognition process for KTP engagement, in order to address noted criticisms about career progression

Develop a campaign, designed for individuals and Departments, to promote the benefits of KTP engagement

After surveying staff in order to identify issues with administrative systems related to KTP engagement, consider how processes can be improved to redress any imbalance

Identify those with intrinsic interest in engaging, or experience in industry, and invite them to an event promoting KTPs

DEPARTMENT

Provide less experienced academics with an experienced departmental mentor to advise with issues of industry engagement

KTPs

Gather further evidence of the rate of KTP approval and associated management processes, in order to develop a strategy to address weaknesses in the administrative process

Offer guidance and develop strategies to challenge and address issues with project based working relationships

INDIVIDUAL MOTIVATION

Offer KTP academics the opportunity to participate in a targeted campaign designed at awareness raising in the academic community

Figure 21- Recommendations at different operational levels

6.3.5 Higher Education policy level

6.3.5.1 Greater consideration as to how academic reputation is measured is required, in order to address the inequalities between research academics and industry engaged academics

Interviewing academics from newer universities identified issues related to academic reputation, connected to KTP activity, but also to academic careers generally. In particular those who followed an industry to academic trajectory, and less experienced academics, felt that their academic efforts went unrewarded and unrecognised both by their universities and the academic community as a whole. They felt that too often academic reputation was measured according to REF outputs, as well as papers presented to esteemed journals, and, accordingly, their project based engagements were less highly regarded. Some also found that they were being overlooked for promotion because they did not have a doctorate, or because their commitment to enterprise and KTP engagement delayed or prevented them from publishing journal papers. Whilst it is appreciated that there has to be a means by which research grants are evaluated or promotions administered, there needs to be greater flexibility built into the system, if a number of industry focused academics are not going to feel disillusioned and de-motivated by academia. This issue was also identified in the Regeneris (2010) report which noted disincentives to participation, including the relationship of KTP to REF and the image of the KTP. Both relate to the way in which KTPs were viewed in terms of academic reputation; there was the suggestion that academics saw them as less worthwhile, thus acting as a disincentive to participation. Whilst some institutions interpreted the contribution of KTP activity to REF in more preferential ways, Regeneris suggested that greater thought needed to be given to incentives for academic participation, and there needed to be more strategic direction in order to encourage participation.

6.3.6 University level

6.3.6.1 Consider formalising the university recognition process for Knowledge Transfer Partnership engagement, in order to address noted criticisms about career progression

Conversations with some individuals identified concerns about career progression being adversely affected by engagement in KTP and enterprise activity. Withdrawal of financial/career developmental rewards for enterprise, and restrictions on career progression could affect participation levels. Formalising the career progression process and giving recognition for good work would alleviate some of the tensions. It would give individuals a sense of relatedness to the university, and support feelings of competency because they would be able to master their environment, especially if there was a degree of autonomy with regard to how rewards and recognition were administered and managed. Formalising the process might also address the concerns expressed in the Regeneris study (2010), which highlighted what they called the “(often) misplaced view,” (Regeneris, 2010; p.8) that KTPs are not as worthwhile as other research activities, nor as good at generating good research outputs.

6.3.6.2 Develop a campaign, designed for individuals and departments, to promote the benefits of Knowledge Transfer Partnership engagement

Lee (1996) found that US academics working at higher ranked institutions were less likely to engage in enterprise activity because they felt dissonance and because it did not match their perceptions of what it meant to be an academic. There were also fears it would restrict academic freedom. Reviewing KTP interview data there is no suggestion that this is the case according to academic responses. The reason could be that because the academics are employed by universities with a tradition of enterprise engagement there is not the same feeling of dissonance. Also they feel supported and feel their knowledge is valuable to the university. When academics begin to feel they are not suitably recognised for their KTP efforts then de-motivation becomes an issue. Instead, the benefits of KTP engagement should be recognised university wide, and individuals encouraged to participate if it is something in which they are intrinsically interested, want to engage with and feel would benefit their career. A publicity campaign highlighting the benefits of KTP engagement, sharing university success stories, would give recognition to those academics involved. They would then feel a sense of relatedness to the university and to their departmental colleagues, and their competencies and knowledge would be recognised, encouraging them to continue with their engagement in this activity.

6.3.6.3 After surveying staff in order to identify issues with administrative systems related to Knowledge Transfer Partnership engagement, consider how processes can be improved to redress any imbalance

Evidence from the data analysis suggests that there might be some weaknesses in the administrative systems related to KTP engagement. Universities were criticised as being too risk averse, expensive, slow, and overly bureaucratic. Whilst it is appreciated that universities represent complex organisational structures, the value of KTPs should also be appreciated. When companies had difficulties negotiating the administrative processes, and academics found the processes not to be as responsive as they would have liked, it presented a challenge to the motivation of those involved. It would be worthwhile surveying staff to identify where problems exist in the administrative processes, to see what kind of strategies or systems could be employed to address bottlenecks and to enable staff to be involved and be able to contribute to decision making. Surveying both those with particular experience of KTP engagement, and those expressing frustrations, would meet their need for competency, enabling them to have the opportunity to share their knowledge in a constructive fashion.

6.3.6.4 Identify those with intrinsic interest in engaging, and those with experience in industry, and invite them to an event promoting Knowledge Transfer Partnerships

Both the data analysis and the literature review suggest that having an initial interest in engaging with industry, and / or experience of working in industry, is important for stimulating engagement in KTP activity and university-industry collaborations. KTP engagements benefit the university in terms of revenue streams, and potential repeat business, and therefore it would be in the interest of the administration to identify those academics with an interest or experience, in order to determine whether KTP activity may be appropriate. A dedicated event promoting the merits, on a personal level for the academic, could be an opportunity to target individuals. Academics could be provided with the opportunity to share their knowledge and experience, and then be matched with advisers and / or companies with whom they could develop relationships in order to develop their sense of relatedness. They would engage in this activity voluntarily and would decide if the event was to their liking, thus ensuring their need for autonomy would not be controlled. Alternatively, a promotional event could be built into a Continuing Professional Development (CPD) plan, or as part of the employment

induction process. This would be a more controlled activity and, for some, could challenge their motivation because they would feel less autonomous.

6.3.7 Department level

6.3.7.1 Provide less experienced academics with an experienced departmental mentor to advise on issues of industry engagement

Evidence from the literature review suggests that younger or less experienced academics are more likely to be influenced (or motivated) by peer pressure, and could be subject to “professional imprinting” (Aschhoff & Grimpe, 2011). This might be viewed as a learning opportunity, particularly for those who are interested in enterprise engagement. If the younger or less experienced academic perceives that the mentor has knowledge and expertise, then self-reported knowledge sharing should be greater (Wang & Noe, 2010). This would be a meaningful experience for both and as long as they engage freely, and feel their needs for competency and relatedness are met through the experience, SDT suggests it would be motivating. It might require administration or line managers to identify individuals who would benefit from guidance and advice, or would be suitable in a mentoring role, unless it was a more informal opportunity guided by chance discussions.

6.3.8 Knowledge Transfer Partnership level

6.3.8.1 Gather further evidence of the rate of Knowledge Transfer Partnership approval and associated management processes, in order to develop a strategy to address weaknesses in the administrative process

Regeneris (2010) identify one of the weaknesses of the KTP product to be the administration system which is inefficient, time-consuming, and overly complex. These concerns were voiced by participants, and delays had led companies to the point of withdrawing from the KTP process, venting frustrations that the time-scales did not match with the immediacy industry required. For the academic this was a de-motivating experience, but because they were generally experienced at working with industry, and were also well respected, they were able to use their competencies to manage relationships. Their experience and relatedness to others meant they were able to offer alternative methods of working; their need for autonomy was addressed enabling them

to work beyond the university confines so, despite being frustrated by the process, their motivation was not harmed long term. The reputations of the academic and the university were also secured which is motivationally beneficial. It is further suggested that by gathering additional evidence about the administrative process it would be possible to identify bottlenecks in the system and resolutions could be sought for the short term initially, and then longer term strategies could be developed.

6.3.8.2 Offer guidance and develop strategies to challenge and address issues with project based working relationships

Participants experienced some difficulties in their relationships with the companies in the partnership. Sometimes this came about because the company did not offer the level of commitment expected, and at other times this happened because the company lacked a full understanding of the intricacies of KTP engagement. Where KTPs were developed from personal contacts or from direct approaches by the company to the academic relationships ran smoothly and collaborations were successful. Where the KTP office managed the relationships and instigated partnerships there seemed to be misunderstandings about the level of commitment required, whether it be financial commitment, or, for example, the support for the Associate, and this suggests a breakdown in communication. A review could be undertaken in relation to the promotion of the KTP product in order to ensure that the messages being delivered highlight the importance of collaborative, supportive relationships. Ideally, at the beginning of the project the responsibilities of the academic, the company, and the Associate should be made clear otherwise poor working relationships will have a detrimental effect on motivation because individuals will not feel their need for relatedness is being met from involvement in the group.

6.3.9 Individual level

6.3.9.1 Offer Knowledge Transfer Partnership academics the opportunity to participate in a publicity campaign aimed at awareness raising in the academic community

The report by Regeneris (2010) identified that KTP was a well-liked product but it lacked effective promotion and, in some institutions, buy-in at a strategic level. Academics who have engaged in KTP projects could act as promoters, and share their

experiences with other academics in order to raise greater awareness. Case studies of their experiences could be shared, highlighting the benefits gained from KTP engagement particularly in relation to research, and teaching and learning. They could also be encouraged to share their experiences at induction events or as part of CPD programmes. The academics would need to engage in this activity willingly, and have a choice as to how they share their experiences, or they could feel that their behaviour was being controlled. Sharing their experiences should promote feelings of competency, and sharing the experiences within a supportive environment should meet their need for relatedness. The activity should be meaningful to them and would therefore be more likely to be internalised.

6.3.10 Summary

As suggested, the relationships between the different levels of recommendations are connected because KTPs do not operate in isolation. They operate within a higher education environment, and are dependent upon the individual academic being motivated to engage in the operation of a successful KTP project.

Recommendations will not be easy to implement because this requires changes to policy, and changes to university processes. It would also require resources, in terms of finance and of personnel to enact changes. At individual level there needs to be a change in attitude, but because academic reputations are important, this will have to come from individuals and their university and department, providing the strategic direction for engagement in KTP activity. This needs to be supported by policies that place greater emphasis on the benefits and impacts of KTP activity.

6.4 CONCLUSION

This chapter has brought together the findings from the literature review and data analysis in order to point out similarities in motivation for both research collaboration, and patenting, and KTP activity. Academics engaged in entrepreneurial, industry facing activity, are motivated by a love of knowledge, and a sense that they (still) belong to industry. They are not driven by financial rewards, but rather by engaging in new research projects, establishing new contacts, connecting teaching and learning to research, and, importantly, transferring knowledge. They also are motivated to support the development of less experienced members of staff, and enjoy helping companies

resolve problems. From establishing the common motivators, focus turned to considering the instances where motivation had been affected. There are still issues over the image of engaging in enterprise activity, which appears to lead to issues concerned with career progression, departmental support, and project administration. In order to address these weaknesses a series of recommendations were developed. The recommendations are indications of how the KTP landscape could be improved, but also how the motivating aspects can be built upon.

7 – Conclusion

7.1 INTRODUCTION

Academics were interviewed for this research study in order to determine what motivated them about KTP engagement; it was found that a love of knowledge and learning were key intrinsic motivators, as well the opportunity to act autonomously and prove their competency. Extrinsic motivators included opportunities to feel related to industry, to transfer knowledge and connect research to teaching and learning, and to facilitate networking opportunities and potential for future collaboration. Tangible rewards generally did not motivate, but individuals wanted to feel properly recognised and appreciated for their engagement activity, with opportunities being made available for publishing research and career progression.

Prior research highlighted the concern that knowledge transfer and university-industry collaborations were sometimes frowned upon by academics for fear it would restrict their academic freedom, however most of the academics interviewed felt that engagement in KTP activity complemented their traditional academic role, and believed that engagement in successful projects benefited their reputation. The biggest challenges facing KTP academics were getting the opportunity to write up their research, academic snobbery, and role overload.

The research adopted a critical realist philosophy which meant that it was possible to explore perceptions and different levels of reality. This was particularly useful as it has been anticipated that the environment in which KTPs operate might have had some bearing on intrinsic and extrinsic motivators and barriers to motivation. The policy environment encouraged knowledge transfer activity, especially when this led to innovation, company growth and productivity, and suggested that academics could be incentivised to share knowledge. Universities themselves do not have such systems in place, and tangible rewards for engagement were on the decline. Whilst this did not concern many, the administrative processes did and, as a result, academics were generally frustrated by the KTP programme. A series of recommendations sought to build upon the benefits, and also address the frustrations faced by many academics engaging in KTP activity.

This chapter is designed to summarise the main findings from the research study, and is structured as follows:

- review the aim and objectives to understand how these were met;
- understanding the contribution to knowledge;
- detailing the limitations of the study; and,
- reflecting on future research opportunities.

7.2 MEETING THE AIM AND OBJECTIVES

The aim and objectives were stated in the Introduction. The aim was as follows

in the context of Knowledge Transfer Partnerships, evaluate the motivations of individual academics, for the purpose of making recommendations to enhance participation

and the objectives were as follows

- to understand why the academic is attracted to, and motivated by, involvement in KTP activity;
- to evaluate the intrinsic and extrinsic motivators for KTP activity, and to understand the barriers to motivation;
- to provide a series of recommendations which build upon the benefits, and to address the barriers to motivation for the purpose of making engagement more motivating for the academic, as well as to ensure more successful collaborations for universities

The reason for choosing to research KTP and individual academic motivation was because it was an under-researched area. The researcher had experience of how the motivations of individuals change over the course of a project, and wished to investigate if this was the case in KTP activity, and to discover any effects on project engagement. The literature review, which established the findings from prior research,

identified that there might be barriers to motivation; after conducting the pilot study this was confirmed. It was therefore felt important that recommendations be considered which could contribute to the debate about maintaining and enhancing academic engagement in university-industry collaborations.

The interviews were structured in such a way that the academics were given the opportunity to reflect on what motivated them to become an academic, and what initially motivated them to engage in KTP activity. The data analysis was then structured to provide the best, and clearest, understanding of the intrinsic and extrinsic motivations, and these were reviewed in relation to meeting the basic needs of autonomy, competency and relatedness, as per SDT.

As well as using traditional semi-structured interview questions, the interview schedule adopted a Likert scale, and card sort, to provide an alternative method of evaluating knowledge, experiences, and perceptions of motivation that were being shared. The researcher established that the Likert scale was not as successful as the card sort, because there had been insufficient research and practice in using this approach. As will be suggested in following sections, the Likert scale could be employed again if more appropriate phrases were used, based on the evidence from this study. The card sort was more successful and, whilst the process could be refined for future use, it produced interesting results suggesting that the academics enjoyed the opportunity to be challenged and that enjoyment and satisfaction were strong motivators. In other words, their need for competency was met through the activity with the project structure generally providing a supportive environment where the academic is able to act of their own volition.

The nine recommendations provided in the discussion chapter cover issues ranging from a requirement for a more uniform recognition process for knowledge transfer activity to activities to promote the benefits of KTP engagement to academics, particularly those questioning whether KTP activity is compatible with a traditional academic role. The recommendations build from the identified intrinsic and extrinsic motivations and address concerns and barriers to motivation at organisational, policy and individual level.

7.3 CONTRIBUTION TO KNOWLEDGE

The study has contributed knowledge to two current focuses of research. Firstly, the university-industry engagement debate related to how best to transfer knowledge between the two organisations and, secondly, to studies of motivation. It has built from the basis of these debates of individual academic motivation, in the context of KTP engagement.

7.3.1 University-industry collaborations

7.3.1.1 Selection of participants

An important reason for choosing to study KTPs is that they are relatively under-researched. Most studies of university-industry collaboration focus on patenting, licensing, and spin-outs, or the mechanics of knowledge transfer and project development (Martin et al., 2008 as an example). Therefore, to study KTPs as case studies, and to focus on individual academic contributions and motivations, rather than project mechanisms, represents a contribution to knowledge.

Another contribution to knowledge about university-industry collaborations is the focus on academics at newer universities. Previous studies have focused on academics at research intensive universities, and Lam regarded this as a limitation of her study (Lam, 2010). The focus on academics at newer universities is a fair representation of academics engaged in KTP activity. The highest percentage of academics engaged in KTPs, comes from departments where the Grade Point Average is between 2 and 2.99 (Technology Strategy Board, 2010), and these departments are not expected to exist in research-intensive universities.

7.3.1.2 EU policy - motivation

So that university-industry engagement best benefit academics, universities and society, the aim of this research study is to evaluate individual academic motivation in order to provide recommendations about how to improve the knowledge transfer process. Motivation features in European policy related to knowledge transfer and university-industry collaborations. It highlights two important aspects of motivation and university-industry collaborations. Firstly, collaborative activity provides an opportunity for academics who are intrinsically motivated by more entrepreneurial inclinations. Secondly, extrinsic motivators such as career development and incentives can be useful if correctly administered. By supporting the belief that motivation as well as the

development of a product through testing, marketing and launch, are all aspects of the entrepreneurial journey of the academic towards new-idea generation and potential benefits this can occur. According to EU policy the opportunity for collaboration with industry is a means to attract and motivate academic staff with more entrepreneurial inclinations.

The EU recommends that each university has a career development and incentive policy to encourage and support knowledge transfer and skills development. This is directly relevant to the objective of this research study: the development of guidelines for universities administering and managing KTPs. According to EU best practice, the policy should be fair, easily understandable and be transparent. It should be linked to career progression and have a large and immediate influence. With regards financial rewards, the EU suggests that these should be used with caution to avoid having a negative influence. Individuals can be rewarded if they go above and beyond what is expected of them in their normal working practices. The rewards should be reflective of the effort put into activity, and any profit would need to be divided equally between the researcher(s), the research institution and the industrial partner.

This research study identified that, for the most part, that academics engaging in KTP activity were not motivated by pecuniary gain. When asked how academics could be rewarded for engagement the response was based predominantly on a wish to be recognised and appreciated for their work. Whilst many felt that they were appreciated by the company, a number felt unappreciated and unrecognised by either their department and/or their university. Those expressing a desire for pecuniary benefits were not asking for an increase to salary, but wished for funds to ensure their personal and professional development was met. This was of particular interest because a number felt that engaging in KTP and enterprise activity affected their career progression and that opportunity for personal development, be it conference or symposium attendance or participation in training events, could support the activity. For this reason a recommendation was made that universities ought to consider formalising the recognition process to ensure that academics engaging in KTP activity, and other enterprise engagement, feel sufficiently valued. Some universities do recognise KTP activity as part of the REF submissions, but this is not a typical approach.

7.3.2 Motivation theory

7.3.2.1 Self Determination Theory

7.3.2.1.1 Contribution to theory

The purpose of this section is to consider how this study has contributed to theory by adopting a critical realist, qualitative approach. SDT is strongly empirically based, but the interests in individual's frame of reference, means that it is a less rigid form of positivism. This study concludes that SDT was an appropriate theoretical lens, when it was applied with a critical realism research philosophy. Quantitative studies dominate SDT; consequently this qualitative study offers an alternative approach, but it's still supported by SDT theorists who comment that research is not exclusively conducted through laboratory or experimental research (Ryan & Niemiec, 2009, p. 264). This research study is particularly concerned with the impact the context has on the participants engaging in KTP projects and for this reason critical realism is relevant. Critical realism posits an epistemology that there is a real world to discover, but we can never know everything about because some ideas are abstract. It also posits an ontology where reality can exist independently to us, and can be seen in the physical, mental worlds, and through social artefacts such as organisational culture. The epistemology allows for the application of a theory to a new research area because it does not place emphasis on generalising to a population, but also provides the opportunity to consider the multi-layered nature of society. The research study has demonstrated that KTP activity does not act in isolation, and, as a consequence, there needs to be an awareness of how policy affects engagement and the relationship the project and individual have with their institution. It is a relevant ontology because it moves beyond an understanding focused solely on individual perceptions, to an understanding of "real" issues which, in Popper's World 3 terminology (Popper, 1978), are abstract from the reality of positivism. This understanding of the multi-layered world is particularly relevant for studies about KTP engagement.

As will be demonstrated in subsequent paragraphs the Researcher has adopted a rigorous approach to data analysis. This could be seen as adopting a positivist discourse but by engaging in "epistemic reflexivity" (White, 1997 in Gough, 2003, p. 28) she has been able to reflect on her engagement with the participants, and consider

how her presence might have effected the conversations engaged in. Krauss (2005) suggests that data analysis techniques by researchers adopting a critical realist standpoint should be guided by an epistemology reflective of a paradigm that attempts to acquire social knowledge. This means recognising the role of the research in the data collection and data analysis, engaging in meaning making with the participants, and ensuring their voice is heard thorough the use of direct quotations.

Critical realists approach the research being value aware, and this was thought particularly relevant due to the researcher's prior experiences. Positivists reject this notion because knowledge is acquired from experience alone. The difference in the approach means that qualitative research was more suitable. Furthermore, because SDT is a meta-theory of social psychology and places value on understanding the social world the Researcher argues that critical realism, which is value cognizant (Krauss, 2005, p. 761), is a suitable vehicle for gaining knowledge of reality as understood and experienced by the various participants. If the Researcher properly subscribes to the critical realist epistemology then to engage in qualitative research was correct because face-to-face interaction is necessary in order to participate in the mind of others (Krauss, 2005, p. 764).

7.3.2.1.2 Rigour and accuracy in data analysis

Gough (2003) comments that on the one hand "...reflexivity improves rigour, enhances transparency, accountability, and general trustworthiness of qualitative research" but on the other, when criticising positivist approaches for being regimented and focused on replicable results, qualitative researchers "...can end up (unwittingly) reproducing a positivist discourse which prioritises rigour and accuracy" (Gough, 2003, p. 28). The interviews conducted for this research project were analysed using a rigorous process which was repeated with every participant in order to ensure increased trust in the results. The data analysis process is described in Figure 22 below

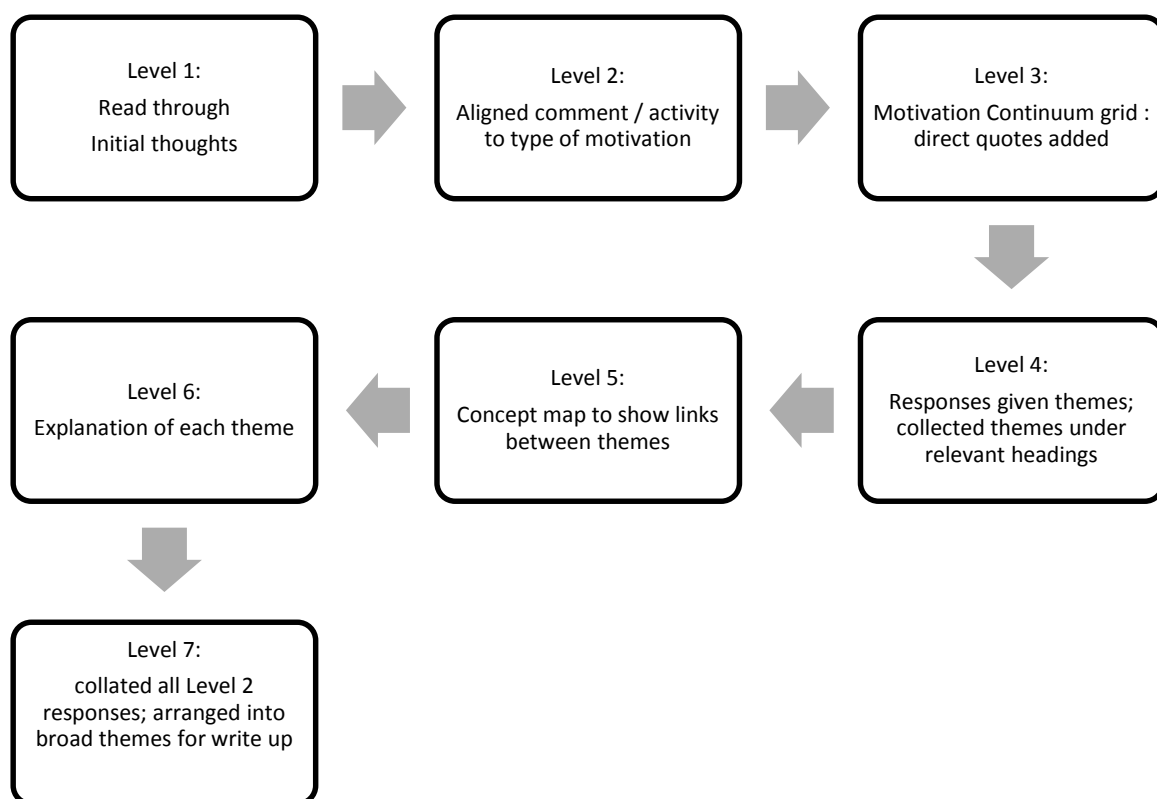


Figure 22 Process of data analysis

7.3.2.1.2.1 Stages of the data analysis process

The researcher ensured she recorded the interview but also took notes to increase accuracy and to remind her of salient points. A grid design was used to record answers to one question, whereas a Likert scale and card sort were used elsewhere. Whilst the Likert scale might not have been entirely successful it highlights how the Researcher attempted to find a way to understand the different realities of the participants involved in the research study. Asking them to comment and describe their understanding of the words used in the Likert scale was a way of meaning making, which ensured that common meanings were clear and unique meanings were discussed. Unique meanings required a rich intricate process of constructing meaning and recognising the different factors and individuals influencing a meaning (Krauss, 2005, p. 763).

Once the interviews were transcribed and listened to and reviewed twice, the researcher set to analyse the data presented to her by the participant responses. During the Pilot study she assigned themes to the data; these themes were generated

from her initial review of a number of theories of motivation but she quickly found that the analysis was confusing, particularly when she made an attempt to report on her findings. Adoption of SDT and the decision to use the Motivation Continuum as a means for analysing the data, as well as giving the analysis a degree of structure to enable its practical application during the research write-up, gave the researcher a degree of security that she had found a workable approach. She applied Braun and Clarke (2005) method of thematic analysis to the data, using the 5 step approach which identified initial codes, and eventual themes. At Level 1 she tried initially colouring different levels of motivation in different colours (yellow for intrinsic motivation, red for amotivation etc) but this became confusing and in the end suitable quotes and comments were highlighted in one colour only. In Level 2 the interesting quotes were reviewed and a motivation code (IM, AM, etc) was applied to the data, which was then collected in the Motivation Continuum grid as shown in Figure 23 below

| INTRINSIC MOTIVATION (IM) | EXTRINSIC MOTIVATION | | | AMOTIVATION (AM) |
|--|-----------------------------------|------------------------------------|---------------------------------|-----------------------------|
| | Identified Regulation (IDR) | Introjected Regulation (IJR) | Externally Regulated (ER) | |
| | | | | |

| |
|-------------------------------|
| BARRIERS TO MOTIVATION |
| |

Figure 23 - Motivation Continuum grid

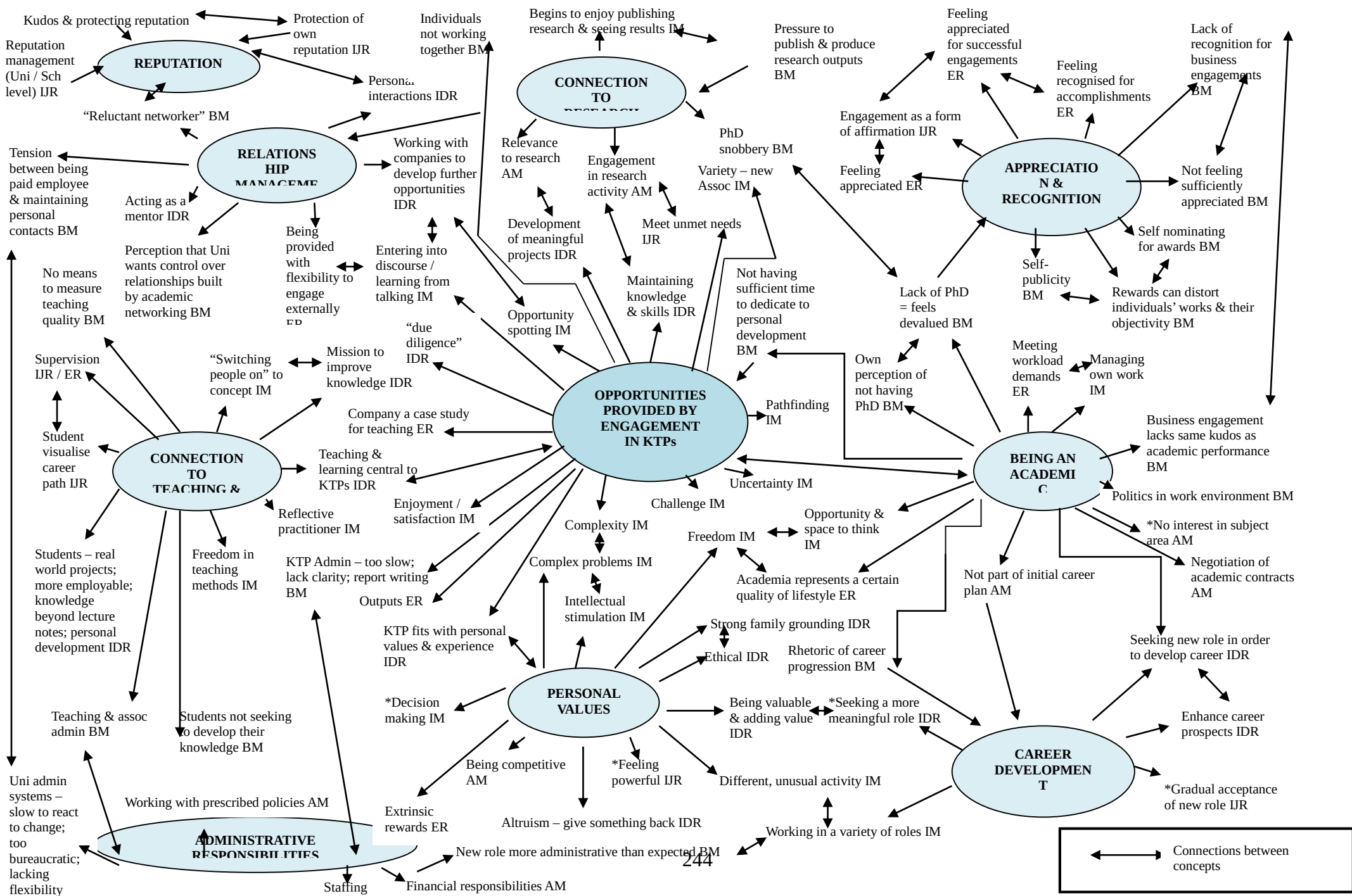
From the interviews and the analysis of the interview data the researcher quickly recognised that the Motivation Continuum grid she had adopted did not accommodate responses participants about what prevented them from feeling engaged as KTP academics. The researcher's response was to add an additional section called Barriers to Motivation because these issues were sufficiently important to the context in which KTP projects operated and they needed to be recognised and discussed in the data analysis. This issue will be discussed in greater detail in the following sections.

Once responses for each individual were collected and collated and suitable themes were assigned to the responses a detailed concept map was developed to show the link between concepts and themes (Level 5). An example of a concept map is provided overleaf (Figure 24). The concept map proved useful for understanding the relationship and connectivity between themes, and showed that the context was particularly important and relevant to KTP activity. At Level 6 each theme was described in order to detail what was or was not included, which was helpful for the researcher to ensure there was accuracy in the data collection. When the data analysis was conducted for each individual participant all Level 2 responses were collated in order to aid the write-up process. This is represented in Figure 25 and shows the process the Researcher used to determine similarity in responses. Data analysis reporting used direct quotes from the participants to ensure the Researcher got as close as possible to detailing opinions and in doing so providing an "...objective insider account..."(Gough, 2003, p. 28).

When writing-up the research the researcher had to make some careful decisions about what was included and how the question responses were edited. The researcher made clear that the Likert scale question did not work as expected; she included the results for transparency and made comments, but because there were issues in the way the Likert scale was designed, she felt that the results did not bring anything extra to the data analysis. Gough suggests issues like this could have been "...coded as initial shortcomings in the narrative of progress culminating in the 'truth'" (Gough p.29) which suggests there is some merit in the inclusion of this data.

The researcher also had to make decisions about which data extracts were selected for inclusion in the write-up. As Gough (2003) suggests its "...invariable that the analyst plays a dominant role in writing and editing the 'script'" (Gough, 2003, p. 30). It is important that the researcher is considered to be trustworthy and to this end the author has already stated her position in terms of personal experience and interests. The researcher when selecting which direct quotations to include consider those quotes that best represented examples of motivation. In some cases there was extensive background information provided by the participant but the researcher, whilst making reference to this, also recognised that the purpose of the research was to understand motivation in the KTP context. The researcher, therefore, had to take

the decision to omit sections where there was an over-elaboration on personal history which did not serve to provide any meaning to joint understandings of motivation. These sections were analysed as part of the process but were only reflected upon briefly in the write-up. This was done mainly for purposes of brevity, but in so doing so she has used her own cultural norms, values, and emotions to make these decisions.



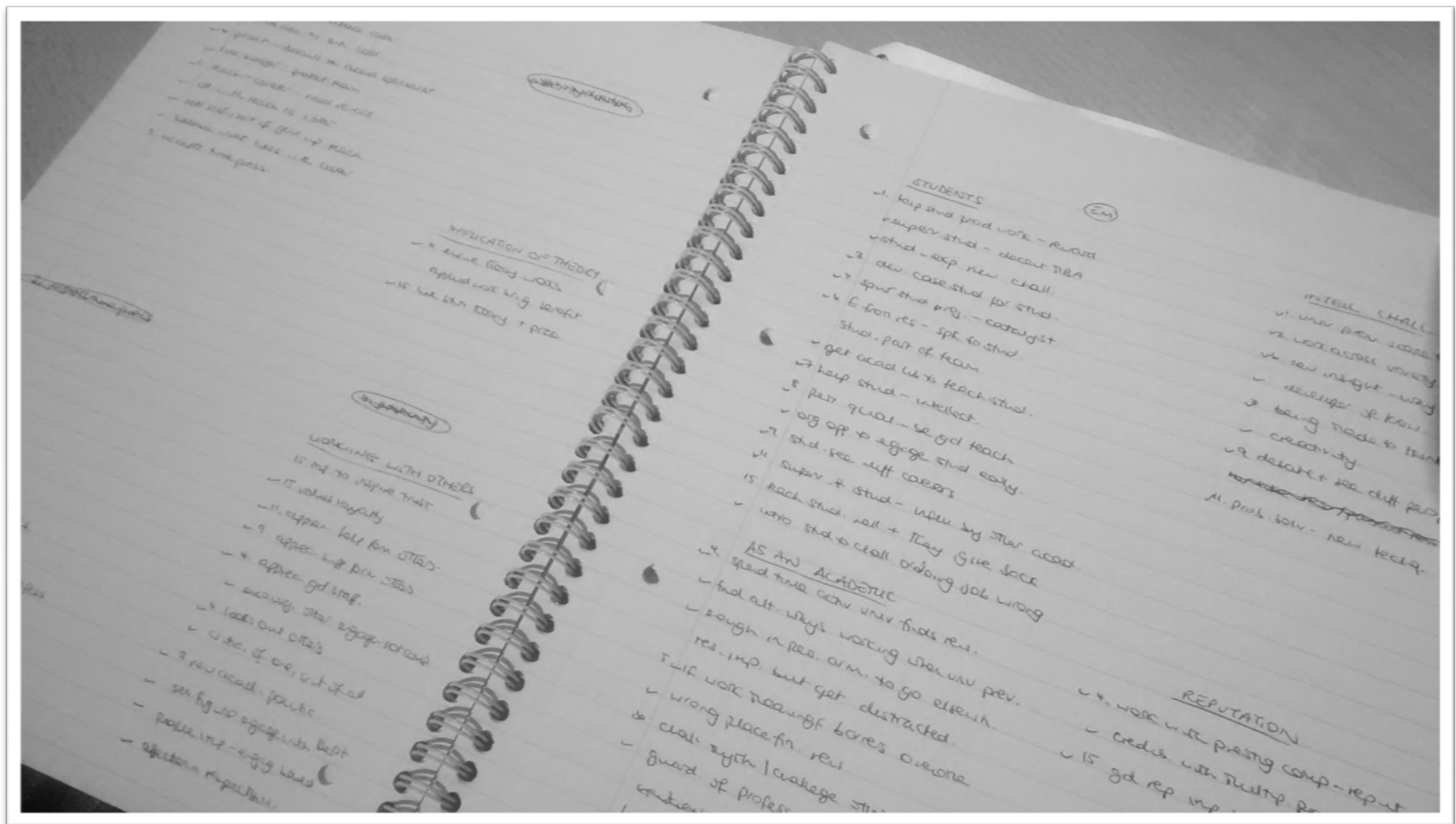


Figure 25- Level 7 collation of response

Figure 26 represents how innovation, knowledge and knowledge transfer connect in KTP activity, and how the relationship can be understood in terms of SDT terminology. Innovation, and the formation of new ideas which benefit the business and the academic, require the academic to have volition in order to decide how to engage in developing a product. If academics have an intrinsic motivation, expressed by love of knowledge and learning, then are made to feel competent because their knowledge is such that it enables them to respond to the problem faced by the company. Thus by developing an innovation solution, the need for both autonomy and for competency are met and the individual is motivated. Knowledge develops out of prior experiences and use of existing competencies. Therefore KTP activity also meets an individual's need for competency by providing an opportunity to develop new knowledge which can be shared through means suitable for supporting the development and maintenance of academic reputations. Additionally KTP activity connects to teaching and learning, providing opportunities to gain knowledge in new areas of interest which are then shared with the student body. As far as the academic is concerned, being able to share new experiences and competencies supports their desire to be innovative in the classroom, and thus meets their need for competency, which in this case is extrinsically motivated. Knowledge transfer is an activity that involves co-operation, and trust, and should meet an individual's need for relatedness as long as the environment is supportive. This is the basis of how a KTP relationship works; the academic feels their need for competency is addressed because they have new knowledge; they are then able to share this knowledge because they are confident in what they know, and feel it will be valued by the organisation they are assisting. Likewise, the Associate is involved in the transfer of knowledge, and this relationship is important to the academic, not just as a conduit between knowledge base and company, but because academics value the opportunity to help Associates. These activities meet the need for relatedness, and as long as academics are free to manage these relationships themselves, then it will be the most autonomous form of extrinsic motivation. Furthermore, where the relationship has been good, and supportive, there is the opportunity to discuss further collaborations and begin the cycle once again.

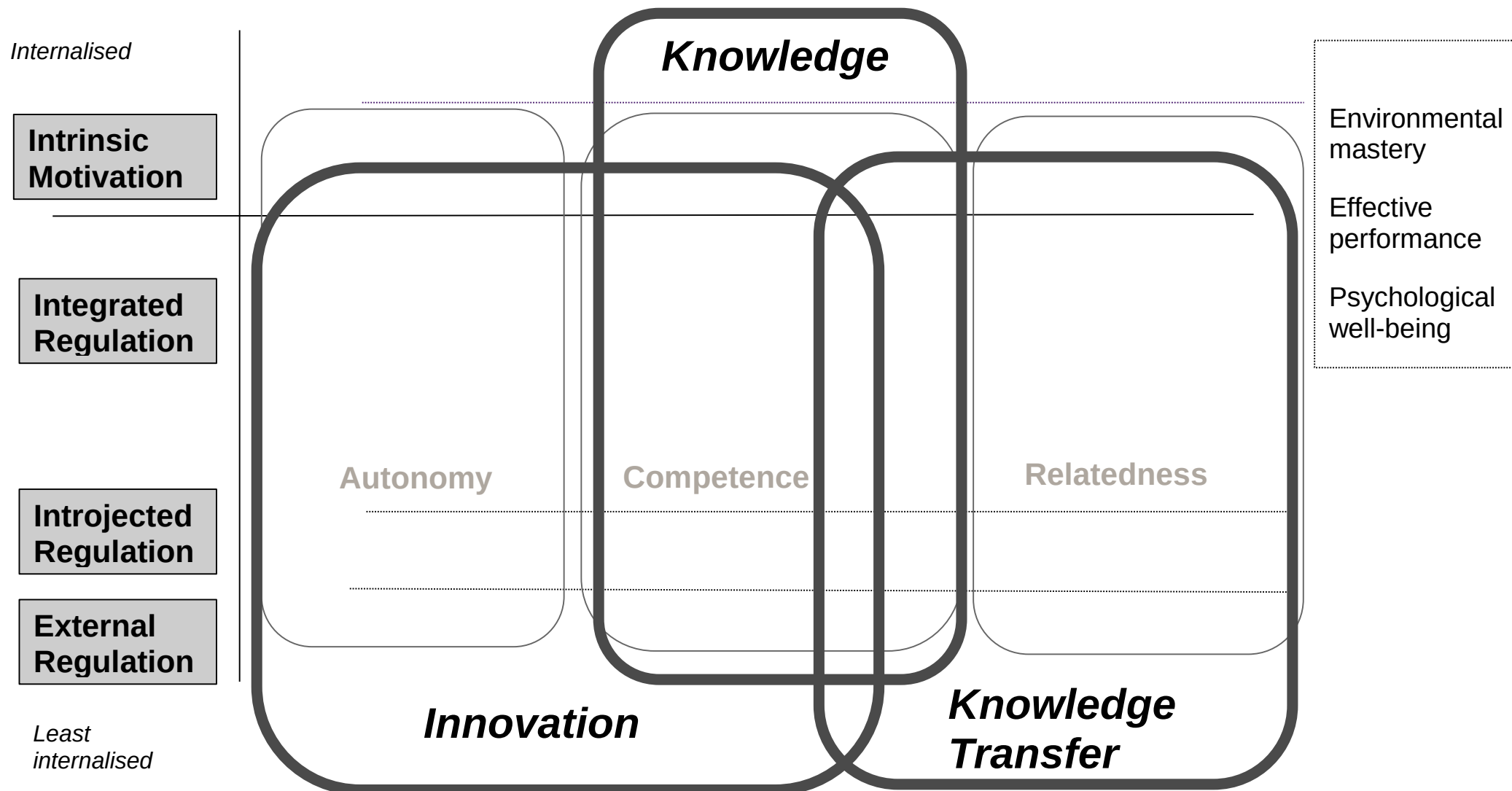


Figure 26 – Innovation, knowledge and knowledge transfer interaction, as supported by basic needs

7.3.2.2 Comparison to prior research

Applied SDT research is most dominant in the fields of education (teaching and student learning), sport and exercise (including coaching and achievement), and health (including health promotion, habit avoidance, managing health issues). It was not possible to identify any examples where SDT has been used to understand motivation in the context of KTP engagement, and consequently this research offers an alternative application for SDT.

As there is no direct comparison with SDT specific research, the most relevant studies that can be used for comparison are written by Lam. In 2007 she conducted a study of 'linked scientists', scientists engaged in activity linking the university to industry, and considered their motivations and showed how to reconcile any tensions that occurred (Lam, 2007). Variables which affected responses included early career experience and discipline. These were noted, and the importance of them to this research study was considered.

Lam followed up her 2007 study with a 2010 study of 36 academics employed at research intensive universities (Lam, 2010). She found that whilst many were motivated by extrinsic motivators such as opportunities for research commercialisation, there were academics who pursued research collaborations with industry because they found it interesting. Her 2010 study provides an attractive comparison because of its use of SDT as a theoretical framework. She argues that SDT provides a useful lens for examining the multi-faceted nature of motivation and that

“...its emphasis on self-regulation in the motivational process is particularly germane to the case of academics who enjoy considerable freedom in their work” (Lam, 2010, p. 8).

These justifications are similar to those made for applying SDT to this thesis.

She also applied the work of Stephen and Lavin (1992), (cited in Lam, 2010) to her research. Stephen and Lavin believe that the scientific reward system is comprised of 'ribbon,' 'gold,' and 'puzzle' rewards. These are summarised as follows:

- Ribbon relates to reputation based rewards, the most significant being publications;
- Gold relates to financial benefits and, like ribbon rewards, are extrinsic;
- Puzzle relates to problem solving or inherently interesting activity which, by its nature, is intrinsically motivating.

Lam argued that the different motivational drivers can co-exist and that academics participate in research commercialisation with a relatively high degree of autonomy. However their beliefs in the value of the activity may vary because of their experiences. Their participation and feeling of autonomy are dependent on the extent to which they have internalised the values associated with it; the academic who is 'entrepreneurial' is more likely to be intrinsically motivated compared to the extrinsically motivated academic who pursues the activity for the purposes of funding research.

Lam draws some interesting conclusions which are similar to those being explored in this thesis. This study interviewed academics employed at newer universities as its study group. It offers an alternative perspective to surveys of academics employed at elite universities, where, as a consequence, it is expected that the institutional pressures will be different. The academics are employed in a range of disciplines including science and engineering, but also food science, construction and management. This provides the opportunity to explore the extent to which the same motivations and pressures exist across different disciplines. Furthermore, KTPs offer a specific type of knowledge transfer, involving a partnership between university/academic and company, company and Associate, and Associate and academic. These KTPs are highly dependent on the success and strength of the relationships that are formed, and both good and more problematic relationships could have an effect on academic motivation.

7.4 LIMITATIONS OF THE RESEARCH STUDY

Whilst the research design was beneficial for reviewing individual perceptions of motivation, there were limitations in relation to the choice to study individuals, specifically academics, working in newer universities.

7.4.1 Difficult to generalise to a population

The population generalised to in this case is individual academic staff. Studies adopting SDT are typically positivist in their research philosophy, and because positivists believe that phenomena are observable and testable, and make hypotheses that can be tested and accepted, or refuted, it is possible to make assumptions about the way individuals experience how their needs will be met. These are generalised assumptions based on empirical testing, and because individuals across all cultures experience these needs, it means their applicability is strong.

A critical realist philosophy whilst corresponding to scientific enquiry focuses on senses and perceptions as experienced in the mental, physical, and abstract worlds. This approach suits qualitative studies. The semi-structured interviews presented an opportunity for academics to express their opinions and for the researcher, whilst being aware of her own experiences, to interpret the responses. Self report questionnaires, or laboratory studies, are more suitable for comparing results across groups of individuals and might have been a useful approach to adopt prior to engaging in qualitative study. This would have required a mixed methods approach, adopting a pragmatic research methodology, which could still be a useful approach to adopt in future studies especially with a larger sample size. This would require an overall understanding before more in depth case studies were to be carried out.

7.4.2 Selective sample – size of sample, location, and universities represented

Information from the KTP Annual Report 2009/10 suggests that departments where the Grade Point Average is between 2 and 2.99 (Technology Strategy Board, 2010, p. 21), are departments from newer universities, rather than research-intensive ones. The universities that were chosen for the sample were newer universities and consequently the results can only be said to be applicable to academics at newer universities. Further research would be needed to broaden the applicability by including individuals from Russell Group and / or research-intensive universities.

The individuals were all located at universities in either the north or the south east of England. Whilst location is less likely to have an affect on research results, there is limited applicability of the results to universities across England because of the restricted location of the sample. Further studies would broaden the sample to ensure universities across England were represented.

The sample size consisted of 15 academics. A larger sample size would also broaden the applicability of the results, and would be likely to include more female academics, and early career academics, for who representation was only a small portion of the sample. Discussion of future research studies takes this issue into consideration and proposes studies to consider the motivation of female academics, particularly as current debate suggests that women lack representation in STEM subjects.

7.4.3 Motivations known only of academics

Individual academics were the focus of the research study. It is their motivations which were considered, rather than studying the motivations of all participants, that is the business and the Associate. Individual academics were chosen because understanding their motivation with respect to KTP activity is an under-researched area, and therefore represents a contribution to knowledge. To understand the motivations of all participants however, would certainly contribute to a better understanding of the needs of the business. The motivations of participants could be prioritised, to ensure that the needs of the academic, business, and Associate were addressed. This would avoid barriers to motivation found in this study, such as businesses being unclear as to what the KTP was designed to deliver, or failing to fully commit to the process.

7.5 DIRECTION OF FUTURE RESEARCH

This study was specifically designed to gain an understanding of the motivations of individual academics engaged in KTP activity. The interview structure was designed to provide opportunity to understand initial motivations, and motivations related to academia, before focus turned to KTP engagement. This was a valid and interesting research unit on its own but it also highlighted other gaps in understanding. Addressing these would expand, and further knowledge, in the area of motivation and KTP engagement.

7.5.1 Using study data for a larger scale study surveying all academics engaged in Knowledge Transfer Partnership activity

Whilst it cannot be assumed that all academics engaged in KTP activity would be willing to respond to a survey or study, it would be interesting to broaden the study to

include more participants, and to question them about their motivation to engage in KTP activity. Data from this study could be used to guide semi-structured interview questions, and a similar strategy of cross case analysis could be used to determine key data points. The data collected would provide a more comprehensive analysis of the motivations and barriers to motivation and would be useful for developing promotional campaigns or targeted publicity.

7.5.2 Targeted sampling strategy to uncover female academics engaged in Knowledge Transfer Partnership activity

It is not possible to find data to identify the proportion of female academics engaged in KTPs compared to male colleagues, but in this particular study the gender bias was towards males. Whilst this was an unintended consequence of targeted and snowball sampling strategies, it is perhaps reflective of the dominance of STEM subjects, particularly engineering, which, despite national campaigns to encourage females, have a tendency to attract male, rather than female, researchers. The results are therefore more reflective of the experiences of male academics. The study used a targeted approach to identify suitable universities in north west and south east England, but an alternative study could use a sampling strategy specifically targeting female academics engaged in KTP activity. This would require contacting Knowledge Transfer offices to identify potential participants, or a social media campaign to alert participants to a study. It would be interesting to see the type of engagement activity and KTP projects female academics tended towards, and to see if there was any gender bias in this respect. One of the female participants interviewed felt she was overlooked and lacked praise and recognition as a result of her gender. A larger sample would identify if this was a trend, and whether or how it affected motivation. This study did not seek to identify whether the motivation of female academics was different to male academics. It might require a different set of interview questions to enable the researcher to ascertain intrinsic and extrinsic motivations. A larger sample size could provide this opportunity and the lessons learned could impact on how KTP activity was promoted in future.

7.5.3 Study to determine the motivations of STEM academics not engaged in KTP

From this doctoral study there is a bank of evidence which demonstrates what motivates and what de-motivates academics in KTP activity. It would be useful to be

able to compare this data with data from interviews with non-engaged Science, Engineering, Technology, Management (STEM) academics. These would be individuals who are not engaged in KTP activity (or indeed any other externally facing knowledge transfer activity). Participants could be identified via traditional survey, or via a social media campaign, both of which would be targeted to attract participants who tended towards a more traditional research and teaching role in academia. Data from the quarterly reports of KTP activity by Innovate UK could be used to target universities with low levels of KTP projects. Surveys or questionnaires could ask about intrinsic and extrinsic motivations and particularly what was seen as a barrier to involvement in KTPs. For the purposes of comparison rather than target all academics it would make sense to revisit STEM subjects and business management and ICT. It is expected that some may simply not be interested, but it would be useful to discover any prejudices towards KTPs, and to understand what strategies could be utilised to redress this balance.

7.5.4 Identify Knowledge Transfer Partnerships where it is possible to study the motivations of all involved in the project

This project focused on the motivation of the academic lead, rather than the motivation of all project participants. It therefore provides a snapshot of the motivations of one set of individuals. To understand whole projects, and how motivation of one person affects another, would require questioning individuals from the company, and the Associate, as well as interviewing the academic. Potential projects could be identified by Knowledge Transfer offices, and the focus could be on both successful projects and projects where relationships are more challenging. There would be value in doing this because it would provide the opportunity to identify both motivations and challenges to motivation. Identifying commonly held motivations would be useful for promotional campaigns and for delivering targeted training if required. Likewise, if there are any frustrations it is important to see if any can be reconciled, or how they might be accommodated, to ensure the project is a success.

7.5.5 Research to understand whole project life-cycle, with a focus on motivation

Knowledge Transfer offices could be approached to identify projects at conception stage which could be studied as a whole life-cycle. Whilst this may be challenging, it could provide access to data which would indicate critical points in the project where

motivation either peaked or waned. Understanding how and why motivation to engage changed over time would provide valuable data for looking at means for improving the KTP process, and the process and administration of KTP activity within the university setting.

7.5.6 Revisit the Likert Scale using appropriately judged phrases

The research study has provided plentiful data about what motivates academics engaged in KTP activity. As part of the interview schedule a Likert Scale was used to question participants about the qualities they thought an engaged academic should demonstrate. The responses were too heavily weighted to the “strongly agree” or “strongly disagree” and consequently they proved unusable. It would be interesting to use a Likert Scale again, but with a better understanding of the processes, and with statements, rather than single words, designed to allow the participant an opportunity to pause for thought. Whilst a Likert Scale would not represent a whole study, if organised better it could be an appropriate tool for collecting research data.

7.6 CONCLUSION

The purpose of this chapter has been to summarise the findings from the research study and reflect on whether the aim and objectives have been met. The contribution to knowledge was also considered, as well as limitations of the study, and potential for future research. It is important to note that, however much the researcher tried to be a dispassionate observer, her own experiences still had some bearing on the research study, and her judgements, based on the facts presented and chosen to be shared by the interviewees.

The aim was to better understand the motivations of academics engaging in KTP activity, in order to better guide the management of KTPs. The individual academic has the opportunity to inspire and educate the more reluctant, and universities and the KTP programme need to consider how better to align the administrative processes to ensure the flow is smoother. The KTP is a successful, well regarded product, which has the potential to deliver innovations to companies and, as long as the policy environment remains supportive, and academics find the process motivating, it should remain beneficial to all involved.

APPENDICIES

Appendix 1 - Researcher prior experience

Before beginning the thesis the researcher had worked as a university research assistant on a number of projects where universities engaged with small and medium sized businesses and the community in order to deliver projects for business growth, community cohesion, and, facility use and management. Her interest, therefore, lay in the broad area of Regeneration, with education, research and training, at the heart of all projects. She had worked as a Research Assistant at University of Liverpool and at a local authority in a housing department before joining University of Salford.

During her time at University of Salford she experienced at first hand how different individuals worked together and how complex and challenging relationships can be, and it is safe to say the experience had a significant impact on her own motivation. This project transferred knowledge from the university to community organisations and small and medium sized businesses and was a two year ERDF funded research project which focused on construction skills. It had four strands of different activity. In her strand there was a Project Director, Project Manager and four Research Assistants, each covering a different geographical location. Each week the project team met to discuss “sign-ups” and targets.

Initially the project team worked well together, and the Researcher had strong intrinsic motivation including an interest in the subject area and enjoyment from working on an academic research project. Additionally the Researcher had been told at interview that she would be signed up for Doctoral study and this was motivating because it met with her intrinsic interest in gaining and applying knowledge, and was extrinsically rewarding because Doctoral study was to be personally rewarding. The project team attended monthly Doctoral workshops with the Project Director, a Professor at the university.

The Project Director had not understood the complexities of ERDF funding restrictions and it was quickly realised that Research Assistants were unable to commit time to Doctoral study as part of their employment contract. The Project Director was adamant that his Research Assistants should be able to commit to studies and this caused issues with both the Research Centre / Department and Project Manager. For the

Researcher this was a de-motivating experience because she was very keen to study for a Doctorate. The Project Director attempted to find ways for the Researcher to remain engaged in Doctoral study but this proved impossible so instead he offered the Researcher opportunities to present at conferences. Whilst the Researcher was interested in this, and appreciated his attempts to provide her with some future research projects, it did not quite compensate for not being able to study for a Doctorate. Perhaps this goes some way to explain why, when the ERDF project ended and the Researcher was presented with options for Doctoral study and employment she chose Doctoral study.

Within the project strand the different individuals involved had a good relationship until the relationship between one Research Assistant and the Project Director changed, resulting in the Research Assistant being transferred to another project strand. It was revealed she was in receipt of a significantly higher salary than the other Research Assistants, because she was also expected to generate income for the Research Centre. After a year it became apparent that she was not generating additional income and her relationship with the Project Director broke down. The Researcher had a good relationship with both parties involved and it placed her in an awkward, and ultimately de-motivating, position. The Researcher felt she had a loyalty to the Project Director, and she liked him personally, and the other Research Assistant was someone who was her friend, and on occasions being placed as a go-between was not appealing to the Researcher.

During the length of the ERDF project another Research Assistant resigned and then, in the last months of the project, leadership of the project outputs was taken under the control of a Project Manager who managed the whole project (4 strands). The Project Director had had a more relaxed attitude to project outputs and consequently the Researcher Assistants were under pressure toward the end of the project, to meet expected outputs. This was not a particularly motivating experience at this time because it was realised that there would be no continuation of the project or project team, despite best efforts from the Project Director to bid for funding for alternative programmes of activity.

APPENDIX 2 – INTERVIEW STRUCTURE

Appendix 2 – Interview Structure

INTERVIEW SCHEDULE – MOTIVATING ENTERPRISING ACADEMICS INTERVIEW

Thank you once again for agreeing to be interviewed.

This interview will form part of a pilot study for my doctorate. I am researching what motivates academics to engage in enterprising activity – activity where there is engagement between the academic and either industry or the community.

I will use the data to review the interview process and therefore I would appreciate it if I could record the interview. I would also like to share the interview with my supervisors so as they can help me review the interview process. Can you confirm that this is ok?

Question 1

Before considering your enterprising activity, **I wanted to first ask you what motivated you to become an academic?**

- At what stage in your life did you decide to become an academic?
- What is it about the academic life that you like?
- What barriers are there in your academic life?
- Was there someone in your academic career that motivated you?
- What was it about them that motivated you? What characteristics did they have?
- Was there someone in your personal life that motivated you?
- What was it about them that motivated you? What characteristics did they have?

Question 2

I now want to ask you about your experience as an enterprising academic.

Tell me about a recent experience of a successful enterprise engagement that you were involved in

6. What was your role in the project? Who else was involved and what were their roles? How did you manage the relationships?
7. Where did the idea come from? Did you have complete control over the idea or was it created collaboratively? How did you feel about relinquishing control?
8. How did you know this activity was successful? What metrics did you use to measure the success? What were the motivating outcomes that made you want to engage again?
9. How did success act as a motivator? How did being successful make you feel?
10. Were you successful because of your own efforts? How do you know? How do you think you control your own success? Were there any barriers to higher achievement?
11. Were you successful because of the team and the environment you work in? How do you know? How do you think this controls your success? Were there any barriers to higher achievement?

Question 3

I want you to again think about a recent successful engagement with industry or community.

Motivation theory suggests that our **work environment** can be an important motivator or can be de-motivating.

I have a chart / table with me with a list of “motive domains” identified from a literature review.

Thinking specifically about your working environment, can you tell me how each is either motivating or de-motivating.

| MOTIVE DOMAIN | MOTIVATING | DE-MOTIVATING |
|--|---|---|
| Relationships <i>How do your working relationships with industry and community differ from your academic career working relationships?</i> | <i>How do you find these relationships motivating?</i> | <i>How do you find these relationships de-motivating?</i> |
| Personal growth and development opportunities <i>What opportunities are there for personal growth and development when engaging with industry and community?</i> | <i>How do you find your opportunities for personal growth and development motivating?</i> | <i>How do you find your opportunities for personal growth and development de-motivating?</i> |
| Responsibility <i>What responsibilities do you have for the project?</i> | <i>Do you find having responsibility is something motivating?</i> | <i>Do you find having responsibility is something motivating?</i> |
| University administration <i>How involved have university administration been in your project?</i> | <i>Does the university administration system help motivate you to continue your engagement? How?</i> | <i>Does the university system hinder your continuing engagement with industry and community? How?</i> |
| Policy environment <i>How does Government or other policy affect your project work?</i> | <i>Does the policy environment act as a motivator? How?</i> | <i>Does the policy environment act as a de-motivator? How?</i> |
| Working conditions <i>Are your working conditions the same when you engage with industry and the community?</i> | <i>How do your working conditions help you to be motivated to engage with industry and the community?</i> | <i>How do your working conditions hinder your engagement with industry and the community?</i> |
| Variety of skills needed <i>Do you find enterprise engagement more varied than academic teaching and research in terms of</i> | <i>Is having to have a different skill set motivating? How?</i> | <i>Is having to have a different skill set de-motivating? How?</i> |

| | | |
|---------------------------------------|--|--|
| the skills you need to be successful? | | |
|---------------------------------------|--|--|

Question 4

I want to now move on to focus on your individual qualities.

In front of you is a *Likert Scale* ranging from Strongly Agree to Strongly Disagree.

I am going to show you a series of words which represent qualities a motivated enterprising academic might have.

I want you to think of yourself, focusing purely on you as a motivated enterprising academic.

I want you to tell me where on the scale these words should be placed, after having reflected on your personal qualities as a motivated enterprising academic.

- What qualities do you think you have as a motivated enterprising academic?
- How do you know? What evidence could you use to back this up?
- Are there any qualities you wish you had?
- Why would you like these qualities? What difference would they make?
- Are there any words / qualities missing?

| | | | | |
|--------------------|----------------------|-----------------------|-----------------------|--------------------------|
| Proficient | Versatile | Empowering | Unconventional | Self-motivated |
| | | | | |
| Amenable | Co-operative | Enthusiastic | Spontaneous | Competent |
| | | | | |
| Dedicated | Skilled | Sociable | Detached | Analytical |
| | | | | |
| Creative | Philanthropic | Procrastinator | Committed | Confident |
| | | | | |
| Independent | Energetic | Altruistic | Supportive | Strong work ethic |
| | | | | |
| Decisive | Driven | Appreciative | Tenacious | Organised |
| | | | | |
| Dominant | Self-assured | Responsible | Determined | Nurturing |
| | | | | |
| Ethical | Influential | Critical | | |

Question 5

Focusing now on a project you have recently been engaged with, I want you to think about what motivated you to keep engaged.

I have another series of cards, representing words which could be used to develop a storyline of a project's development.

I would like you, if you can, to use these words to represent the story of your project's development. You can use as many or as few words as you like.

- Why have you chosen to put that word there? How did the project being [word] motivate you?
- How could the project development have been different if A hadn't happened at that stage? Do you think it would have been more motivating if it had happened at a different stage?
- Are there any words you would like to add?

Novel

Complex

Habitual

Intense

Uncertain

Satisfying

Variety

Enjoyable

Challenging

Competitive

**Connection
to teaching &
learning**

**Connection
to research**

Question 6

Motivation theory is heavily focused on rewards and incentives as motivators and I am wondering on your opinion, in respect of using rewards and incentives to motivate enterprising academics.

- What rewards and incentives do you think enterprising academics would find most motivating?
- Are rewards and incentives relevant to enterprising academics? How? Why?

- Why did you choose [word]? How would it act as a motivator to you?
- What rewards and incentives have you been given in the past? How did they motivate you?
- Are there any rewards or incentives that could act as a de-motivator? Why would they be de-motivating?
- How often to do think rewards and incentives should be made to enterprising academics in order to motivate them to be successful? Should they be continuous, fixed, rationed...?

Thank you for your co-operation with this interview.

Appendix 3 – Case Study Protocol

ACADEMICS & KTP ENGAGEMENT
INFORMED CONSENT

- You, the interviewee, have the right to withdraw consent to be interviewed once you have given it, at any stage.
- I, the interviewer, will protect the confidentiality of you, the interviewee.
- The results from this study will be published as part of a Doctoral thesis submission. I, the interviewer, will protect your identity.
- I, the interviewer, wish to record the interview via Dictaphone and / or video camera. This is for the purposes of data collection and analysis and recordings.

Please tick the box if you, the interviewee, are willing to be recorded via Dictaphone and/or video camera.

☐

Recordings will not be released without your permission.

You, the interviewee, can withdraw this right at any time.

I, the interviewee have read and understand the informed consent. I understand that I can withdraw my consent to be interviewed at any time. I, the interviewee, understand that I can, at any given time, choose to not be identified or recorded.

Interviewee Name Date.....
Interviewee Signature

Received Date:
Interview Date:

Example email requesting assistance to select candidates/ encourage interest.

Dear XXX,

My name is XXXXX XXXXX and I am a doctoral student at University of Salford.

I am researching what motivates academics to engage in Knowledge Transfer Partnerships. As part of the research process I am conducting a series of interviews which will be used determine the motivations of academics involved in activity..

I wondered if you could forward my details to academics in your university who are engaged in KTP activity. I am looking to conduct the interviews from the end of November to the end of January (although the sooner the better would be preferable).

I am happy to forward an overview to any willing candidates and would require their consent before proceeding with the interview.

Thank you for your assistance in this matter,

Kind regards, XXXXX

KNOWLEDGE TRANSFER PARTNERSHIPS & ACADEMIC MOTIVATION INTERVIEW

DOCTORAL RESEARCH – OVERVIEW

The research focuses on understanding what motivates individual academics to engage in KTP activity.

The intention is to test the theoretical framework developed from the literature review of motivation theory, in order to determine the most appropriate and applicable motivation theory. The theoretical framework will be tested through a series of one hour interviews with academics engaged in KTP activity. The questions have been generated from the theoretical framework and literature review of motivation theory.

This project has developed partly from working with Prof James Powell (my Supervisor) and colleagues to develop UPBEAT (www.upbeat.eu.com). As a study group we are continuously developing the UPBEAT tool and from discussions it is clear that the motivation of an individual academic who engages in enterprising activity is an area that has not already been researched. By having a greater understanding of individual motivations it is hoped that greater impact can be generated from enterprise activity.

Additionally I spent 10 days in May 2009 on a study tour of universities in the United States. Here we met with American colleagues who worked at universities where outreach with community is a well founded research area, and also the basis of departmental structure. From discussions with American colleagues it was apparent that there was little research focused on what motivated an individual academic to engage in enterprising activity.

Literature related to universities and motivation has tended to be limited to understanding the motivations of student learning, or student engagement with technology. There are examples of studies of academic motivations in HE but the focus has tended to be on academic teaching and research and community outreach programmes, than specifically academics and enterprising / reach-out activity such as KTPs and engagement with industry.

INTERVIEW PROCESS

The interview will last approximately one hour and will take place at a location convenient for you. Providing you are in agreement, I shall record the interview via Dictaphone and/or video camera. The interview will be recorded for the purposes of data collection and analysis and recordings would not be released without your permission.

I shall be asking you questions about your motivations to engage in activity which is enterprising – for example your motivations for involvement in a KTP, or engagement with industry and/or community through an outreach project.

After completing the interview process I shall first complete a transcription of the interview, which I will share with you to ensure the comments made are correct and the transcription is accurate. I shall be analysing the data via content analysis in the main, but also other relevant methodologies still to be identified. I am happy to share my findings with any interviewee and would welcome any comments on the development of the research process and proposal.

Thank you once again for agreeing to participate in this study.

Please remember to complete and return the attached consent form to e.jackson@pgr.salford.ac.uk

Kind regards,

Eleanor Jackson

Appendix 4 – Sample Data Analysis

PARTICIPANT: 15

| INTRINSIC MOTIVATION | EXTRINSIC MOTIVATION | | | AMOTIVATION |
|-------------------------|---|---|----------------------------|-----------------------|
| | <i>Identified Regulation</i> | <i>Introjected Regulation</i> | <i>External Regulation</i> | |
| | Academia / previous career linkage | Need to move from comfort zone but could cause personal tension | Financial reward | Desire to be academic |
| | Research is valued | Some students not ready to be challenge – think around this | | Serendipity |
| | Engagement should be part of identity of School | Attempts to overcome language barrier | | Work pressure |
| | Helping people do job better | Has a degree of choice of who to work with | | Professional esteem |
| | Collaboration | Good reputation enables more choice | | |
| | Teaching others well enables them to give something back – enabling | Will take responsibility for someone else's mess if likes the work on offer | | |
| | Others help in articulation | Uncomfortable with being seen as influential | | |
| | Getting self a mentor | | | |
| | Rapport / relationships | | | |
| | Learning from others | | | |
| | Likes others who help to develop ideas | | | |

| | | | | |
|--|--|--|--|--|
| | based on their experience | | | |
| | New contacts | | | |
| | Collaborative working | | | |
| | Learning from leader in subject | | | |
| | Despite no tangible benefit, worked for free | | | |
| | Wants control over teaching load despite extra work it creates | | | |
| | Engagement activity provides useful material for class | | | |
| | Academic outputs | | | |
| | Further collaboration | | | |
| | Activity of benefit to others | | | |
| | Activity contributes to prestige of research centre | | | |
| | Activity of benefit to others | | | |
| | Helping others make sense of their own world | | | |
| | Emancipator role | | | |
| | Building of relationships- long lasting | | | |

| | | | | |
|--|--|--|--|--|
| | Research – enterprise – experience circle | | | |
| | Building and keeping capacity in workforce | | | |
| | Enterprise activity = challenge | | | |
| | Prefers approach to education that relates to societal transformation | | | |
| | Wants people to stand up and be counted | | | |
| | Dialogue & building dialogue important | | | |
| | Active listener | | | |
| | Providing purpose for activity | | | |
| | Appreciates support from enterprise office – changes way does projects & reduces bureaucracy | | | |
| | Appreciates university support for enterprise | | | |
| | Develop individuals | | | |
| | Internal recognition | | | |
| | Connecting with real world important | | | |
| | Helping others develop analytical | | | |

| | | | | |
|--|---|--|--|--|
| | tools to assess their own understanding | | | |
|--|---|--|--|--|

| BARRIERS TO MOTIVATION |
|---|
| Academia job prospects weren't quite as expected |
| Personal circumstances meant could not travel – restricted types of projects could join |
| Dislike of selfish of others |
| Selfish people tend to have traditional view of academia |
| Enterprise engagement impinges on career progression |
| Discrepancy between what paid and what thought should get |
| Many people money motivated |
| Others who teach without experience of real world |
| Shouldn't be in Business School if don't want to engage |
| Qualitative research not seen as valuable |
| Enterprise = freedom but challenged? |
| Not a typical teaching academic |
| Doesn't like students who need mothering |
| Gets no rewards so questions why doing activity |
| Political workings of collaboration organisation |
| Issues with project timings |
| Economic climate poor |
| Aims of project not always adhered to |
| Desires of organisation not compatible with what evaluation is about |
| Dislike of managing budgets – feels it inhibits progress |
| Tension between not wanting to manage budgets compared to issues related to people who hold budgets and what do with them |
| Lack of incentives for enterprise |
| Issues with getting teaching loads covered whilst do enterprise work – creates extra work |
| Tensions between project objectives and politics of organisation |

| |
|---|
| Frustrated by way project is measured as being successful |
| Qualitative research and cause and effect doesn't suit mechanisms which recognise metrics – mismatch between qualitative & measureables |
| Change to evaluation criteria during project |
| Quantitative data doesn't easily come from socially complex projects |
| Qualitative research not seen as valuable |
| Disheartened |
| Finds difficult to adapt way of working – enterprise = challenge therefore troubled. Traditional students have choice to be troubled. |
| Introducing change to organisations – sees as unethical |
| Unethical = discomfort |
| Uncomfortable with providing research that just provides politically correct answers |
| Resigned to doing ethical / uncomfortable work during recession |
| Education as a commodity |
| Not money motivated |
| Language barrier |
| Re-negotiate language used |
| Sexual discrimination |
| Companies struggle with more fluid, less assured approach |
| Less interested in redressing sexual discrimination – rather work in environment where acceptance is their immediately |
| Arrogance (of others) |
| Dislike paperwork |
| Dislike managing people - wants separation in role had in industry to role has now |
| Taking responsibility for someone else's failures |
| Doesn't want to be influential |
| Doesn't want to be CV fodder |
| Doesn't want responsibility for others work |
| Administration system |
| Reduction in research grants |

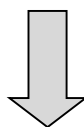
| |
|---|
| Have to work harder to get £££ |
| Purchasers change mind resulting in uncertainty |
| Restrictions on publications |
| Competition for same pots of money |
| Doesn't want to be marketer |
| Had issues with complexity of project |
| Challenging getting people on board |
| Difficulty to get team together when health issues affected participants |
| Struggles to justify financial reward in current economic climate |
| Lack of formal recognition |
| Doesn't necessarily feel valued |
| Recognition of unfairness and inequity in system of rewards |
| Enterprise – takes time to build relationships / network / make connections |
| REF ratings poor for Mode 2 |

PARTICIPANT: 15

INTRINSIC MOTIVATION

| | | |
|-------------------|--|-----------------|
| COMPETENCE | | AUTONOMY |
|-------------------|--|-----------------|

| | | |
|--|-------------------------|--|
| Liked idea of intellectual challenge – liked challenge to read harder stuff and study for higher qualifications | SUPPORTED BY | Believes she has freedom of choice to do what likes – doesn't have to do enterprise but chooses to do it – no pressure re research expectations |
| Previous students challenge & question her which extends her knowledge | | Enterprise fills gap between teaching and has a lot of freedom to do this at moment which she likes |
| Other people have helped her articulate some of her conversations – becomes part of your identity – mentor is stronger at enterprise | | Freedom to identify a mentor and develop relationship |
| Ideas emerged from experience | | Has control over what does – autonomy important to her |
| Gets involved due to expertise – KTP – also learnt from subject leader – learned about politics of Government organisations | | Freedom to engage in KTP |
| Uses contacts in Journals to get published – get account of practice for herself and other academic | | Freedom to explore different ways of learning & sharing knowledge |
| Make sense of own world | | Freedom to be an enabler of change |
| Development of own value and belief system – perhaps due to knowledge acquired or perhaps due to age | | Freedom to question values and beliefs |
| Likes to provide purpose for activity – to make difference | | Has choice not to work with organisations doesn't want to work with – good reputation important |
| Developing knowledge in project – doesn't want to be CV fodder | | Power and control important – values own accountability and responsibility – doesn't like to be responsible for another person's messes but is more willing to do so if likes the work |
| Excited by challenge – engaged academic has certain view of knowledge – circular production of knowledge production and transfer aligned to own experience | | Likes variety – likes having ownership – keep control of money is generating |



| RELATEDNESS |
|--|
| Familiarity / linkages to past career –able to see connections - feels strong connection to teaching role – should engage as part of being in a Business School – keeps academics up to date |
| Job satisfaction from seeing students as managers and seeing how they are doing |
| good mentors – chose influential person she respected – asked them to mentor her – rapport – bounce off each other |
| Likes students who are mouthy, who question her |
| Worked collaboratively with students and Professors – learnt from Professor – not tangible rewards but made contacts, learnt from subject leader |
| Gets account of practice published – will benefit all involved – other practitioners can learn from it as well |
| Help others makes sense of their world- emancipate change |
| Active listening – building dialogue – empathetic listening – understanding another person's values and beliefs – respect for others |
| Needs to be a negotiation of language used – trust takes time to build – establishing statuses takes time – relationship building |
| Doesn't want influence |
| Likes to make a difference – recognises need to look after self – likes to help others develop analytical tools to challenge and assess their own understanding |

PARTICIPANT: 15

EXTRINSIC MOTIVATION

| EXTERNAL REGULATION |
|---|
| Thought academia would equal long holidays – job to fit lifestyle |

| |
|--|
| Seeks job security so hasn't taken same risks as others |
| New contacts |
| Academic outputs |
| Further collaboration |
| Activity contributes to prestige of Research Centre |
| Collaboration on peer reviewed paper |
| Enterprise office & university supportive of enterprise – changing way manage projects – reduces bureaucracy |
| Used to be financially rewarded but doesn't feel it right in current economic climate |
| Internal recognition (within school) |

INTROJECTED REGULATION

| |
|---|
| Certain level of esteem from saying work in academia – not necessarily a key motivator for her personally but it's useful |
| unselfish |
| Activity of benefit to others |

INTEGRATED REGULATION

| |
|---|
| Research output is valued although not as expected as good teaching |
| Will stand up and be counted even when perhaps not best – supports colleagues – more selfish, traditional academics, tend to progress further |
| Important that makes difference & helps people do job better – two way relationship because they come back to her and share what they have done |
| Feels it important that she has taught students well & they can give something back |
| Values loyalty – helps colleague out and will help colleagues out even if they wouldn't help her |
| Collaborative working – learning from subject leader |
| Research – enterprise – experience circle |
| Building of long lasting relationships |
| Keeping capacity in workforce |
| Enterprise activity = challenge – some students not ready for this but if student on KTP then should be |
| Feels has to introduce students to challenges because wouldn't be doing job correctly if didn't – dilemma because not all students |

| |
|---|
| ready |
| Prefers an approach to education that is about societal transformation – people to stand up and be counted – doesn't like education to be seen as a commodity |
| Likes link between theory and practice |
| Good reputation important for choosing type of work does |
| Important to establish trust – values trust |
| Have to be proactive to get projects but likes to be ethical and develop individuals |
| Connecting with real world and making a difference are important |
| Likes challenge & variety |
| Business School has different needs to a Science School |

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